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Refereed Papers

Erewhon: framing media utopia in the antipodes

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ABSTRACT

Erewhon is a geographical location, a novel, and a fragment of our technological imaginary. Described by Samuel Butler as somewhere between nowhere and elsewhere, Erewhon provides a framework for understanding antipodean media art histories. Its fictional representation remains uniquely New Zealand: a utopian society set within a clean green country apparently isolated from networked global systems. In *Erewhon* Butler recognised an ecological intensity that heralded a terrifying shift in societal and technical relations. This paper examines how media artists engage this nowhere place, as both a historical formation and present day high country sheep farm. Artists including Aaron and Hannah Beehre, Jane and Louise Wilson, David Haines and Joyce Hinterding have revisited the multiple mediated layers of Erewhon. Focused on machinic connectivities as well as the morals, social constructions and economic models described in its fictional incarnation, their works suggest an ongoing commitment to a potential future elsewhere and to the construction of media histories that are embedded in concrete locations. In placing the long term concerns of ecology alongside the hopelessness of utopia, this paper suggests that Erewhon continues to offer a critical map for the histories of media aesthetics, machines and humans.

KEYWORDS

utopia, media ecologies, New Zealand, Erewhon, nature

> All paradises, all utopias are designed by who is not there, by the people who are not allowed in. (Morrison, 1998)

> Now that the cloud was there, I began to doubt my memory, and to be uncertain whether it had been more than a blue line of distant vapour that had filled up the opening. (Butler, 1872: 56)

European settlement in Aotearoa New Zealand during the early nineteenth century was predicated on the notion of creating a new society that escaped the class constraints of Britain. It was a country built on hard work, direct engagement with 'the land' and the opportunity to control and master an untouched wilderness. Blinkered to the complex artistic, economic, cultural and social connections to place held by Maori, the subsequent history of New Zealand maintained this element of colonial utopianism. Here was a country where a world dreamt and imagined had the potential to become real. In 1858 the British author and satirist Samuel Butler arrived in New Zealand and began work as a run-holder in an area of mid-Canterbury that he named Mesopotamia – the mountainous area surrounding it he called Erewhon. The farm became the setting for a dystopic tale of machinic and societal control. Published in 1872 *Erewhon* turned the South Island landscape into a fictional world that held a mirror up to the hypocrisies of Victorian society. As a young traveller journeys over the mountains, he finds a new society of green pastures where all technology is feared and banned and where illness is criminalised. In *Erewhon* Butler recognised an ecological intensity that heralded a terrifying shift in the relations of nature to technology; he found dystopic virtuality within utopic reality. Butler's observations of machinic ecology raise questions of the relationships between real fictions and virtual potentials as realised in contemporary media art.

This paper begins with three recent artworks that in very different ways use communications media to map the uncanny experience of revisiting this historical utopian location. Each work engages the South Island of New Zealand, and specific journeys into mid-Canterbury. Each reflects the concerns and histories of a century of colonisation immersed in shifting relations between nature, place, technology and people. Focused on machinic connectivities as well as the morals, social constructions and economic models described in its fictional incarnation, these works suggest an ongoing commitment to a potential future elsewhere and to the recognition of media histories that are embedded in concrete locations. What interests me most about these works is the way that they narrate an engagement with natural environments disturbed and remade by data technologies of sonification, visualisation and exploration. They begin to trace connections between utopia and ecology. The shifting powers of communications media remap Erewhon which is at once utopian and antipodean space; nowhere and elsewhere.

Aaron and Hannah Beehre live in Christchurch, five hours drive from Erewhon. In their installation *DeArmond* (2006) digital fireflies flit around a small cave. In the centre of the enclosed black space is a gleaming ball that slowly rotates reflecting a shimmer of precious stones onto the walls. Amidst the reflected light are floating forms generated in real time and reactive to any sound in the room. Move in the environment too loudly and the fireflies vanish. Hush, and be still and they emerge from the gloom and dance around. Blurring the line between nature and material these lights are generative data that reflect the eccentricities of animal rather than digital matter. And as with any generative materials, the internal workings of the computer determine the real time relationships. The harder the computer is made to work as it produces the creatures, the slower the processing time, which of course slows the computer's ability to measure the sound levels. The creatures become less shy as they emerge in groups (Beehre in Ballard, 2006). In listening carefully they appear to have learnt something about their environment. Sound operates as an interactive determinant as well as a record of audience contribution. There is an oneiric dimension to the mini-installation, at once a map of the night sky and of the animals that inhabit it. The viewer displaces the invisible immersive relationship of a small animal community to its environment that is contained within the four walls.

In *Erewhon,* 'The Book of the Machine' details the complex relationships between nature and culture and the environment that surrounds the city of Erewhon. At one point Butler describes an intimate relationship between bees and clover. French writers Deleuze and Guattari, in their machinic assemblage, translate Butler's bees and clover into the wasp and orchid of a warmer climate (Sutton, 1996). Through the notion of becoming, the wasp and orchid are bound together, "the wasp becomes part of the reproductive apparatus of the orchid, at the same time that the orchid becomes a sexual organ for the wasp" (Deleuze and Guattari, 1996: 10). The orchid becoming-wasp substitutes for the wasps' partner so well that there is no need for another wasp, and vice versa, the wasp becoming-orchid secures the relationship. The fireflies in the Beehre's installation share this kind of mimetic relationship, a relationship that is conducted across species, genetic codes, and bodies (Deleuze and Guattari, 1996: 234-236). The generative data does not turn into, nor imitate, an insect, but remains data-becoming-insect. This implies that wasp and orchid or data and firefly are no longer simply what they appear to be, they are also part of a process that both extends and questions the distinctions that we make between different material forms intensified by multiple ecologies.

In 2004 Australian artists David Haines and Joyce Hinterding undertook a residency in Dunedin where they filmed source materials for their installation *Purple Rain*. *Purple Rain* documents the destruction of a virtual (yet real) montage of New Zealand's southern alps by analogue broadcast frequencies. The artists describe the effect as a "mountain falls through radio waves" (Haines and Hinterding, 2003). In the installation large television antennas hang from the ceiling. Reading the electromagnetic energies passing through the space, the antennas generate waves of sound that motivate an avalanche on the projected mountain. In a literal correspondence, the sound both causes and prevents the snow to fall. The actual material disintegration of the image is dependant on off screen radio energy. The mountain itself is also not present, but created though algorithms of data. This is no longer a specific mountain but a generated amalgam of digital memories of mountain-like forms. The visual image is nothing more than information made visible and set into motion by the shifting surfaces of the sound waves, which corrupt and control its obedience to gravity. The work then largely occurs in the interstitial spaces of transmission. The sound is tremendous, yet the damage is minimal. As Butler warned, machines are shown to have the power to destroy and move nature.

In the country of the Erewhonians, Butler documents a fear of this immense capacity of machines. No machines are allowed in the city of Erewhon as it is believed they could rapidly evolve and take over the world. The Erewhonians, fearful of the tyranny of the machines, have risen in revolt and destroyed all such evidences of European civilisation. Our traveller's watch, for instance, is regarded with extreme horror, and Butler describes the attitude to machines in general:

> If all machines were to be annihilated at one moment … and if all knowledge of mechanical laws were taken from him, so that he could make no more machines, and all machine-made food destroyed, so

> that the race of man should be left as it were naked upon a desert island, we should become extinct in six weeks. (Butler, 1985: 206-207)

This relationship between nature and culture is intensified in Jane and Louise Wilson's video installation *Erewhon* (2004). In Butler's *Erewhon*, illness is considered a crime. Sick people are thrown in jail; sickness is the fault of the individual. Made during a residency in Christchurch, the Wilson's *Erewhon* picks up on these mythologies of moral value systems and the very real slip that occurred in New Zealand as state concerns for health and control became policies of eugenics. The Wilsons found Butler's ideas on crime and disease echoed in post World War I policies that sought to control and consolidate a small population that had suffered a loss of nearly a third of its young men. Not unique to New Zealand the efforts of the government to counterbalance this loss included the building of structures to house disabled veterans, and the institution of specific policies to strengthen young women in order to foster healthy procreation.

Piecing together documentary images of wards at Queen Mary Hospital at Hamner Springs, (a hot springs and spa retreat built to house single women and their babies) and choreographed callisthenic performances by young women in gym attire inspired by archival photographs, the installation of five cantilevered screens creates perpendicular enclaves, spaces within which the viewer finds their own body distorted and reflected. Mirrors, suspended at angles over the screens, further duplicate the projections resulting in a kind of kaleidoscopic effect, echoed in the roving steadycam footage that circulates around and through the building surfaces. The dilapidated wards include two shaped after Jeremy Bentham's panopticon model that housed returning soldiers recuperating from their war experiences. In the installation the performaces begin to address a misguided and polemic sense of institutionalized morality, while the hospital architecture focuses the effects of social control.

Like *Purple Rain* and *DeArmond*, *Erewhon* is a media fiction that blurs distinctions of real and virtual by drawing on a literature of utopia. It does not translate the socio-political ecosystem of an antipodean elsewhere and simply present it to us, but otherwise narrates it. *Purple Rain, Erewhon* and *DeArmond* all use communications media to reconsider narratives of the natural environment. More than this, these works suggest a different kind of structuring of our understanding of the artwork that is not focused on the artefact but on its environmental interrelations. In each case something else is being formed: what we might call a meditation on the relationships between the natural world as located in some elsewhere space of the antipodes and the data that take us there and that contribute to its formation. Digital media is not invisible as it interrupts and reconstitutes the narratives. This means that these spaces are neither pure nor innocent. They are ecological.

UTOPIA

New Zealand is continually recreated in myth and story. Anyone who has travelled over the Southern Alps recognises the landscape in Butler's *Erewhon*. And as the opening scenes of *Prince Caspian* or the *Lord of the Rings* show, it can easily be imagined to be elsewhere. In New Zealand there is an absurd tension between representations of a place where dreams can come true; continued media constructions of a country through a fictitious national identity, 100% pure and full of sheep; and, a *carte blanc* upon which fantasies of elsewhere space can be realised. The surprise with which the Wilsons greeted the revelation of New Zealand's eugenic policies was intense because of the belief held by many visitors that such things can't or won't happen here. There is an ongoing myth that New Zealand has escaped the capitalist degeneracy of other 'western' countries. Unfortunately our shameful economic statistics and child poverty speak otherwise. Colonisation or, to be more precise, re-colonisation is part of the political subtext of Butler's imagery and is one of the keenest threads that can be traced into recent media representations of New Zealand. Butler's observations of nineteenth century machinic ecology continue to map a country that chases the tourist dollar with advertising campaigns focused on immersion in a pure exotic natural environment and mapped by settings for fantasy films. These mythologies entice artists as much as those interested in patting a sheep, and occupy a new space where colonial journeys are reworked into contemporary eco-tourism. It is the journey from one place to another that marks utopia as an always hopeless elsewhere space.

Antipodean ecosystems are not separate to the communications technologies they embody in. Butler travelled over the Southern Alps to find a verdant green place where it appears all technology has been eliminated. Haines and Hinterding travel to record a real space that could be reconstructed as virtual. Of course, their space can never be elsewhere because it is always infected by here, by the radio waves that are present amidst us. The Beehres condense their familiarly with the space into miniature, and the Wilsons as visitors themselves enable a different kind of journey that conflates historical truths with imagined fictions. Could such socio-political extremism really occur in a place of purity? This crossing of space points to the key role of utopia in these media fictions as they mark out blurred lines between nature and culture, here and there, aesthetics and ecology. Furthermore, what does 'ecology' mean if the concept cannot be grounded in an essentialist and clear-cut separation of nature and culture, nature and animal, human and non-human?

In his discussion of "media ecologies" Matthew Fuller broadly defines ecology as "the modes or dynamics that properly form or make sensible an object or process" (2005: 2). Fuller's emphasis is on the formation and dynamics of media systems. His use of the term ecology draws upon Guattari's formulation of ecosophy that examines dynamic systems "in which any one part is always multiply connected, acting by virtue of those connections, and always variable, such that it can be regarded as a pattern rather than simply as an object" (Fuller, 2005: 4). Guattari extends the definition of ecology to include human subjectivity and social concerns. This does not mean that everyone operates together to shared ends but that a social ecology is one born from dissonance, including the wider tensions of different material forces – be these human, animal, spatial, cultural or linguistic as they operate alongside each other (Guattari, 2000). Furthermore, as specific manifestations of systems, ecologies cannot be dissected, and individual segments cannot be analysed in isolation. Whether closed or open, the borders of such systems are constantly in flux, because they are durational. Following Francisco Varela's definition of a machine as "the set of inter-relations of its components independent of the components themselves", there is a tension between materials and the relationships they form (Varela 1979; Maturana and Varela 1980). It was the very different machinic relationships to materials and the body that Butler used to highlight the absurdity of Victorian social values.

UTOPIA+ECOLOGY

Utopian societies are often portrayed as bordered and isolated in some way from other social structures. Although an island, New Zealand is no more isolated than any other networked society. Manuel DeLanda has suggested a number of geological frameworks through which we can understand the mapping of the world and our habitations of it, he writes that "ecosystems involve processes operating at several simultaneous time scales" (DeLanda 2003, p.119). Media ecologies involve the movements of time and space, through the mediations of communications technology. The media fictions highlighted in this paper include the virtualised time and space of the antipodean journey. And like any ecology, paying attention reflects our current mediated location while allowing a glimpse of no-place. Erewhon as both place and text inhabits simultaneous timescales.

But can utopia really be this easily revisited, and in so doing do these works point us towards another manner of engagement with communications media? Utopia isn't just about space, it also houses objects that are normally inaccessible to our direct experience. There is a paradox in this position that unsettles me somewhat. In what way can I put ecology – which is about being in the present, the here and now – alongside a notion of utopia – which is about being here and now but dreaming of elsewhere? Butler found elsewhere in the present of his New Zealand experience. Brian Massumi has made a distinction between hope and utopia, saying that utopia will always be hopeless as it is forever in the future (Zournazi, 2008). Hope, he suggests is about where we are now and the kinds of actions we can perform within contemporary art. By engaging with elsewhere spaces and highlighting the means through which data perform we are able to hope for a shift in our understandings of geographical and social ecologies. These works do this through engaging with a historical understanding of location read through the data of contemporary media technologies.

In each work sound and movement map simultaneous spaces of encounter. *DeArmond* relies on the viewer to mediate their body to control the noise they make. Those who behave and control their bodies

gain access to a haunted space of exotic flickering beauty. *DeArmond* seeks an intangible engagement with mythical creatures made visible by data. It encourages stillness. Like the strengthening exercises the Wilsons document, bodies are subjected to the control of their environment. In *Erewhon* bodies quiver as they attempt to hold acrobatic poses. Each shot lasts twenty to thirty seconds—the same amount of time a person would have had to remain still in order to have their photograph taken in the ninteenth century. These frozen and controlled young women are responding to the physical intensifications of the state and occupy kaleidoscopic screens of visual control. *Purple Rain* is part sound collected off screen and made visual, and part visual image degraded and frozen by the actions of sound. In *Purple Rain* noise constructs a visual object, while simultaneously putting into place the destruction of that very same object. The viewer is helplessly encased in sound, a passive voyeur of the effects of generations of sound waves as they become image and move mountains. Haines and Hinterding make us particularly aware of how transmission flows across and through material forces. The transmission waves that seem to disturb the tranquillity of the mountain scene do so by mapping fluctuations in communication. They make visible the magic of sonic forces as radio waves are seen to move mountains. Movement and control are found to be the methods to access utopia. Not only can space dictate behaviour but the visceral experience of the works positions and implicates the viewer in a refreshingly ambiguous vantage point. In each work there is a complex mixture of frozen movement. None of these works are dramatic, grand statements. On the other hand they each demonstrate the need for media to address Guattari's three ecological registers – the environment, social relations and human subjectivity. The utopian ecologies found here – nature, matter and culture – are dynamic, open and ultimately machinic aggregates; they are data ecologies.

Guattari called for the necessity to create new paradigms, to turn technologies toward humans, to reconstruct singular and collective processes of subjectivation. Because of the immensely variegated landscape in which it is grounded, the culture of Aotearoa is multiple. In placing the long term concerns of ecology alongside the hopelessness of utopia, this paper suggests that both Erewhon the place and *Erewhon* the book continue to offer a critical map for the histories of media aesthetics, machines and humans in New Zealand. In each of the works discussed here we find a history, an account of things that have happened, blurred with a contemporary machinic virtuality. Butler's utopia is the result of experiencing an island settler location where ecology and aesthetics are overwritten by social and political desire. This desire to turn fiction into fact is written into the ongoing media histories of the southern antipodes.

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Between punched film and the first computers, the work of Konrad Zuse.

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The interview for this paper with professor Hosrt Zuse was possible due the collaboration of Juan Carlos Orozco in Berlin.

Abstract
The Z3 computer made by Konrad Zuse in 1941 in Berlin is described, paying attention in detail to the facts and inspirations related with the use of punched film as a store medium in that machine. The text has several interventions by Horst Zuse, oldest soon of Konrad Zuse.

Introduction
Recently the recognition to the work of Konrad Zuse (1910-1995) is increasing given his achievements as a pioneer of the automatic calculator machines and computers but specially because since the end of the last century, thanks to the work of professor Raúl Rojas, amongst others, it became evident that the Z3 machine, can be considered as the first, electronic (in fact electro mechanical), programable, binary computer in history. Thanks to a deep study of the patents made by Zuse in the 1930's and 1940's and the creation of simulations Professor Raúl Rojas demonstrated to the computer sciences community that the Z3 is Turing complete. Nowadays even in Wikipedia it is possible to find information about the work of Konrad Zuse and the Z3 computer, it is often present in historical context together with machines as the Harvard Mark 1 and the ENIAC, however there is not much information at available about the particular characteristics of Z3.
Nowadays Professor Raúl Rojas, is the director of a large project called the "Konrad Zuse Internet Archive" were its possible to access the simulations that helped him to understand the Z3 machine, as well as the original Zuse's patents and in general a bast collection of theoretical works about the work by Konrad Zuze from his first machines as the Z1 to his later works.

There are several things that are remarkable about the work of Konrad Zuse,; first of all the fact that his achievements were as far as possible at such time of any kind of military use; secondly the economic conditions and context in which those machines were built. how creative and (hacker) he was in several aspects even in re inventing the Boolena Algebra; thirdly his persistence -most of his machines were destroyed during the WW II-, and finally his double role as a scientist - his work includes the creation of the first programming language, the Plankalküll- and a he was even a painter.

Self portrait by Konrad Zuse. Horst Zuse Web Site.
Besides professor Raúl Rojas others like professor Horst Zuse, Konrad Zuse's first son have contributed to the understanding of Konrad Zuse's work, and in this case the latter will be his voice and will guide us trough the work his father. Horst Zuse had a special relationship with his father and he was the eyewitness of that process that so important for all of us today.
Before the Z3
The Z1 was the first machine that Konrad Zuse built, in fact, that machine has the same conceptual architecture than the Z3, the Z1 machine was made between 1936 and 1938 in Berlin and it shows in different ways how Zuse found consistently important and small solutions for the practical problems of creating advanced calculating machines. Both of the machines that Zuse made before the Z3 (1938 - 1941), the Z1 (1936-1938) and the Z2 (1940-1941) were privately financed and were assembled at the beginning in the leaving room of his parents home in Berlin. (reference to the text by Kittler).
In the Z2 machine Zuse included telephone relays for the first time, despite the fact that Zuse knew at that time about the benefits that working with vacuum tubes can bring, he decided to work with telephone relays because they were more accessible. Even though the work by Zuse was incredibly advanced, only a few people saw the potentiality of such machines.
Original telephone relay for Z1, Z2 and Z3. Horst Zuse Web Site.
To be able to understand the relevance of Suzeís work it is important to to bear two

things in mind: the first one is that at that time the word “computers” was used to talk about humans that had the task of doing complex calculations, that means that no machine was considered as a “computer” and the second one is that Zuse didn’t have communication with his pairs in the United Kingdom or the United States, so far we can deduce that he didn’t know the theoretical background of the computational theory of Church and Turing and neither did he know the work of people like John von Neuman at that time, it will happen a long as the time of the WWII.
In the words of Horst Zuse:
“This machine [the Z3] is very remarkable and it is accepted today as the first working digital computer world wide, or the first computer with some reductions, because this machine only had an arithmetic unit not a logical unit so it was not possible to compare numbers, it was too complicated at this time to realize it. However it was constructed -how to say- as a minimal system because he was very poor... the financial situation was the following: the Z1 was completely privately financed, it was the Z1 you can see he worked at the living room of his parents and it was financed by his parents, his father - who was a postman- and then his sister -she was a teacher-, some friends from he academic society gave him money and “Kurt Panker ?” who was the owner of a company here in Berlin using simple calculating machines with mechanical basis, table machines, to make simple calculations of additions of numbers but not floating point numbers and so on; and he gave him money, so this machine was financed privately, there was no money from the government for this machine. The same thing happened with the Z2 it was a prototype to try to work with telephone relays, and then the Z3 was financed a little bit by the government they gave him 20.000 “Reich Marks” to built this machine ...”
The Z3
The Z3 was a unique machine and it is in part the focus of this text. To understand the Z3 computer is important to consider that it was made with telephone relays, that means that every telephone relay had to play the role of one bit, because the relays have two states, those states that can be seen as 0 and 1 in a binary system as is the case with the Z3.
In order to understand the principles of this device, we need first to figure out how many relays Z3 had and how they were distributed. The different components of that machine were made with this basic unit: relay (bit). The Z3 had 2000 relays, 700 for the memory, that amount of bits were duplicated because its necessity to store the numbers so in total there were 1400 relays, another 600 relays were used for the processor that include “X” only for the arithmetic unit.
Z3 Aritmetic Unit. Horst Zuse Web Site.
The Z3 had other components as the input keyboard, and the system to display out puts with lamps and the possibility to store and read instructions in punched film, we will talk about that in some detail later on.
Z3 Architecture. Horst Zuse Web Site.
The Z3 computer was able to perform 9 operations, the 4 basic operations which are: addition, subtraction, multiplication and it was also able to calculate the square root. The other four instructions were related with memory management and input out processes like taking the number from a key board and placing it in the register, display the number in the register, and finally store and load the numbers from the memory. That machine used float point numbers, the numbers were represented with 3 elements, one element to determine the sign of the number, another element for the exponent and a third one for the mantissa.
Z3 in Berlin -. Horst Zuse Web Site.
In the words of professor Horst Zuse:
“It [Z3] was a programmable machine with 9 instructions it has a memory for 64 numbers, or lets say 64 objects, and each object 22 bits it was possible to put in numbers here because were only bits realized with relays, only bits, so you could store letters or numbers or what you wanted, it was a binary memory of this machine, then there was the calculating unit (respect -arithmetic- unit associate today) with the four basic operations in binary floating point number: addition, subtraction multiplication, division and square root; the clock frequency of this machine was 5 hertz and in addition the machine needed 3 cycles that means close to one second, 0. 8 seconds; multiplication about 3 seconds, division the same and square root a little bit longer. And this

arithmetic unit made all the basic operations by additions, it means that multiplication was a repeated addition as you do it at home if you are multiplying two numbers and the same for the division, and the square rootÖ."
The launch of the Z3 was not a big success in its time, only five people assisted to the opening and the machine was not operational all the time; however the patents on that machine, the reconstruction and the following works such as simulations show us that we are looking at one of the first electromechanical computers, if not the first one.
Z3 Munchen -reconstruction-. Horst Zuse Web Site.

The punched film use

The use of punched cards is well known as an important component of the computer instructions storage history but the fact that for a long while in Germany some of the computers that Konrad Zuse made used punched film is fairly unknown.This system was designed to record instructions for the computer, for instance the Z3 can work receiving data from the key board, just like a pocket calculator or reading instructions from the punched film, the code to write the instructions is in 8 bits code. Zuse started to use that system because his grandfather used to work in the German film industry UFA.
Konrad Zuse with the punched film in his hands, Z4 machine. Horst Zuse Web Site.
According to Horst Zuse:
"The use of the punched film, as a storage medium, it is not really a storage medium, is not a replacement for the memory, in the memory of this machine there were only numbers, 64 numbers. The punched tape was film it was a 35 mm standard film as it is used by the production companies to make movies, because his grandfather worked with the UFA studios, it was the reason. And it was very good as .. such as "brith ?" 36 mm, and you can make step by step the transport of this punched film, on this punched tape were the instructions of the machine, it was a memory as storage of the instructions, the instructions were not really in the memory of the machine the reason for that is very simple: it was very expensive to do memories at that time, as I said for one bit you need one telephone relay and to buy a relay at that time was 2 Reich Marks and you can see one bit 2 Reich Marks, and soon it was not possible to put in the so called on the memory of this machine, so we have the memory of he instructions on the punched tape and we have some memory for the data in the Z3."
Punched from Z4 machine. Horst Zuse Web Site.
In my opinion the use of punched film was a very interesting decision because at that time the technology to go from one frame to another frame with enough precision was available, they gave the possibility of continuity to the set of instructions, also film is recognized as a stable and non fragile medium, these shows again the creativity of Mr. Zuse.
Finally there is an important functional point that must be addressed here in relation to the punched film system; it is the fact that thanks to the use of film, it was possible to bind it creating loops that would allow the machine to perform recursive operations.
As a person that studied film and that is interested in the work with computers this is more than a simple fact, it is inspirational.
Punched film in loop. Horst Zuse Web Site.

The influence of punched film

Even though the fact that Zuse had used punched film is not well know it doesn't mean that it has been completely ignored; there are very interesting and inspirational examples of reflections about this issue. Probably the most important one is the sentence by Professor Lev Manovich, who teaches at the University of California San Diego, in his text Cinema and Digital Media he said: "Zuse's film with its strange superimposition of the binary over iconic anticipates the process which gets underway half a century later: the convergence of all media, including film, to digital code." According to that it can be said that the history of the digital cinema has its roots in Zuse's work.
Reconstruction of the punch holder used by Zuse. Caspar Stracke Web Site.
In the context of the "Future Cinema" exhibition (2002-2003): "Z2 [zuse strip]" a media art installation that is based specifically in the device to punched the film was exhibited. This installation made by Caspar Stracke receive many interesting critiques and was quite important to show that the device far from being only a rumor was a fact, he used for the installation a replica of the

original machine. That exhibition took place in ZKM, Zentrum für Kunst und Medientechnologie and it is significative because later on in 2004 in the context of the exhibition “Algorithmic Revolution” one of the machines made in the 1960’s by Konrad Zuse to the ZKM was exhibited, that machine is still there and it is working. The Z22 was the first machine using vacuum tubes that Zuse made.

Reconstruction of the punched film reader used by Zuse. Caspar Stracke Web Site.

In order to close this reflections I want to say that we must bear in mind that the non conventional uses of film technology guides us to interesting moments on the history of media arts, it is important to remember that in the 1930’s the film maker Walter Ruttman made an audio work called weekend “Wochenende” using the film camera but with the lens covered with the aim of recording sound only, optical sound. Today “Wochenende” is recognized as one of the first radio art pieces in sound art history of XX century.

Installation -Z2 filmstrip- by Caspar Stracke. Caspar Stracke. Web Site.

Conclusion

During the course MAT 200C with professor Travis Pope, he insisted many times in the important relationship between multimedia and the evolution of computer hardware specially the storage devices. The Compact Disc that gave origin to the CD ROM, was invented for music purposes, the magnetic tape used in the back up process was invented for sound also and the every day most common DVD drive was invented for video originally.

Bearing in mind that multimedia hardware helps to reconfigure the factuality of computers, well, if we think that in the Z3 the storage medium was punched film, we can affirm that that tendency is not only true today but it was around since the beginning of computers, because film was created to work with images, first in photography and later on in movies.

Acknowledgments

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The Forgotten Pioneers of Creative Hacking and Social Networking – Introducing the Demoscene

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During mid 1980s evolved a networked culture that brought together tens of thousands of teenagers within the computerized world: the demoscene. This culture revolved around the production, dissemination, and competition of realtime generated audiovisual works (demos), demonstrating how to maximize specific hardware through unorthodox programming. The old demoscene was a closed community with its own infrastructure, artifacts, software tools, copyright system, aesthetics, economy, and social stratification, but new questions arise with its presence on the internet.

With modems and illegal tricks to use telecommunications, teenagers at remote places could reach fame with their technical efforts in a subculture fenced off from real life identities. They were programmers, composers, and visual artists but also dedicated people that formed the backbone of the social network. Traders and swappers sent data around the world using modems or postal mail, sysops operated the bulletin board systems that people dialled with modems, while ascii artists designed the text-graphics for these boards.

The demoscene receives very little attention in media, academia, and the arts. The paper will focus on communication but also explain the aesthetical aspects in order to fuel current discussions about open source creativity, remix culture, hacker art, digital communicative autonomy, and competition.

Keywords: demoscene, network culture, creative hacking

Intro

In the postindustrial world, networking is becoming a ubiquitous part of everyday life. Blogs and social networking sites create new forms of connectivity, while outside the Internet, other forms of social networking take place with the help of radios, telephones, and modems. These later forms might seem primitive compared to the hyperlinked networks today, but are important objects for research, for studying this past not only fills historiographical gaps but can also provide new insights into the future of networked cultures.

Already in 1979, North American Apple II software crackers were organized in modem networks to exchange data (Walleij 1999). During mid 1980s, teenagers formed possibly the earliest transnational networked digital subculture that centered around creating artifacts: the demoscene. This culture revolved around the production, dissemination, and competition of realtime generated audiovisual works (demos) and competitions, demonstrating how to maximize specific hardware through unorthodox programming to show the most stunning sound and visuals within specific computers.

Throughout the years the demoscene has undergone changes and today the scene is mostly organized on the Internet, even if there are parts of the demoscene still maintaining oldschool traditions. The demoscene concerns two contemporary fields of technosocial studies: network cultures and the politics of computers. While the demoscene is ideal to study hardcore appropriation of technology, the main focus of this paper is the demoscene as a network culture.

In June 2009, The Institute of Network Cultures in Amsterdam published a new book on network cultures in which Geert Lovink put forward important questions for studying contemporary networks. In this paper I will attend to similar questions about the history, ownership, scale, the handling of conflicts, collaborations, social organisation, and dissemination within the demoscene network.

The Illegal Heritage – Hacking, Phreaking, Cracking

As a direct result from the 1980s home computer revolution, children obtained a growing desire to play the newest video games. Unfortunately, most kids did not have the money to buy games. *Crackers* brought the solution to copy games illegally, which was made possible by removing copy protections.

Some of the crackers were driven by old hacker ethics (Walleij 1999, Scott 2005) and others did it e.g. for the challenge or rebellious excitement. Nevertheless, they all wanted recognition for their work, which they achieved by displaying a text screen with their name prior to the game starting. This text screen is in many ways similar to graffiti, although the so called *crack-intros* invaded the private sphere and not the public space.

As the number of software companies incresed, so did the amount of crackers and the competition between them. The best crackers would not only unprotect the software, but also fix bugs and decrease the filesize, and upload it to an important node in the network. Usually, this was a *Bulletin Board System* (BBS) in USA, a computer with a modem that can be remotely dialed into. BBSs were not only used for the exchange of files but also to play games, chat, or send messages. An important BBS was for instance *Pirate's Harbor* (Walleij 1999). BBSs were also important meeting places for hackers and phreakers who provided methods for crackers to (illegally) obtain very cheap access to telecommunications, which enabled a globalized communication.

The feeling of community was strengthened when physical meetings started to occur. As the meetings became more regular in 1988 they became known as *copy parties.* In these parties not only demos were copied; games, applications, VHS-tapes and audio cassettes were duplicated, as well as information about hacking/phreaking and other legally dubious activities (Walleij 1999). These parties contributed to the demoscene's publicly obscure nature. Today illegal activities are mostly disconnected from the demoscene, but had a substantial influence on the demoscene.

The Early Demoscene

Around 1985 the crack-intros became stand-alone artifacts (demos) that gradually grew into more complex works. These productions were group efforts that involved *coders, musicians*, and *graphicians*. Even so, the coder played the main part in the production, as music and graphics were attached after the work of the coder. The group also included e.g. *swappers* who mailed floppy disks to eachother, *traders* that sent data using modems, and *sysops* (system operators) who operated the BBSs. Members were predominantly middle class teenage males from OECD-countries, residing mostly in Northern Europe. It is difficult to say how many people were involved in the demoscene. 10,000 is a very low estimate, while 100,000 is probably too much (Csdb 2009). Furthermore, there has been atleast 40,000 demos and intros released in the demoscene to this day(Pouet 2009).

Speed, quality and originality were important ideals for the members of the demoscene – just like for the crackers. It was important to be the first to invent a special trick, or to refine previous achievements, e.g. displaying as much graphics as possible in the borders of the C64-screen. Queries about who was first could even turn into aggressive battles. *Flame wars* between individuals and groups were common; they occurred in the digital realm but could even cross over into physical violence. Incidentally, these battles are known to have lead sceners to report their (criminal) rivals to the police. This shows how important the demoscene identity was for many people in the oldschool scene, and shows the competitive atmosphere.

Artifacts and Aesthetics in the Demoscene

There are several different types of artifacts in the demoscene e.g. demos, intros, diskmags, text art, music disks, or slideshows. Most of these different artifacts are platform-specific, performative productions, that are distributed for free. Tasajärvi (2004) explains this performativity through the difference between theater and cinema. While movies are static recordings, a theater play (and a demo) is something that is performed in front of your eyes with (minor) differences between each execution. Theater, as well as a demo is platform-specific; while a theater play uses the room's unique features (lightning, floor and space) to enhance a performance, the demo uses the hardware of a specific computer model.

In the early stage of the demoscene, between 1986 and 1996, the methods and aesthetics of demos were not very diverse. Typical demos used elements like scroll texts, hand-pixeled logotypes that would move in sinus curves, rotating 3D-cubes, black backgrounds, fantasy graphics, rasterbars, Western dance music, and tunnels. Another way of describing demos is to list what they were (usually) *not*; most demos

were typically not glitchy (or buggy), interactive, conceptual, following a narrative or generative. In the early 1990s design-demos were introduced, taking an important step towards an increased aesthetical diversity (Tasajärvi 2004). With the variety in contemporary demos it is now more difficult to define what a demo is (or what a demo is not).

The coders of demos used *assembly language* – a complex and time consuming way to gain maximum control of the hardware to make optimized software. The coder would assume that the viewer had the same hardware to his disposal, which enabled more experimental programming in which s/he did not need not to worry about programming "system friendly" software – s/he could freely explore undocumented features of the hardware through trial and error. This was also done by musicians and graphicians, albeit to a lesser extent. In other words, in the early demoscene artifacts were platform specific due to their unorthodox production methods.

In order to show that groups could make something that no one had achieved before, an aesthetical maximalism permeated the demoscene. More graphical elements, more mathematical effects and more sounds made a *better* demo, while bugs, glitches, and irregularities made the demo *worse*.

Demos and Ownership

Since the artifacts of the demoscene were performatives, they were distributed in non-recorded data formats (executables instead of video). This made them suitable for remixing and reverse engineering. The Amiga's music format MOD for instance, was easy to rip by using a program to extract the MOD-song from a demo or game. By loading the ripped file into the correct music software, the ripper could have the same possibilities as the original composer. These possibilities however, did not amount to a thriving remix culture within the demoscene. One reason for this could be the demoscene's norm of clean slate originality: generally it was 'better' to do everything yourself, from scratch. Even if some people used parts of other demoscene works, they ran the risk be called *lame* instead of *elite*. The romantic notion of the isolated author-genius was thus highly present in the demoscene.

Paradoxically then, it has been common practice within the demoscene to make graphics based on paintings or pop culture products, to use songs ripped from video games, or to sample sounds from recording artists. In Amiga MOD-music the rights of samples were simply claimed because you had sampled them – regardless of where the original sound came from. "Don't steal my samples!" was a usual exclamation in these sample cases. By sampling music from a recording artist you appropriated it, which can be explained considering sampling as a creative endeavor in itself. Due to the limited amount of RAM and storage space as well as the sonic bit-rate and resolution of the Amiga, sampling was way more complicated than the flawless cut-and-paste methods of today. Also, it is important to remember that samples were crucial for composers to maintain a personal style. Other than the samples, everyone had the exact same working conditions. In the case of 'sample theft' within the scene, there were no institutions to help the so called victim – instead the sanction would be to discredit the sampler around the scene.

Demoscene artifacts never reached (far) outside the scene, on the one hand because the wider public was not interested, and on the other hand because generally demosceners did not try to reach an outsider public. Moreover, it has always been difficult to contextualize demos since they are neither arty, poppy nor scientific. But this isolation also meant that demosceners never had to bother about official copyright laws – which is still true today and is something that gave the demoscene the freedom to create a unique sampling culture.

The autonomy of the subculture and the importance of originality, aswell as the lack of influence from art world concepts and formal copyright laws, lead me to describe the demoscene as a bounded subculture in which participants primarily compete for respect for their digital craftmanship amongst their peers.

Social Stratification

So far the demoscene has been described as a single entity. But as we move to the social organization of

this networked culture, it might be more helpful to think of the demoscene as an umbrella term for different clusters. Cultural geographical factors gave rise to a rather self-organized Polish C64 scene, while the choice of computers was cause for a separation between e.g. Atari and Amiga sceners. Still, all these individual groups and scenes created performative demos, communicated in similar ways and shared aesthetical attitudes; and in that sense they were part of the same demoscene.

The demoscene is a meritocracy in which anyone can join and have their work judged, regardless of who or what they are (Ratliff 2007). Ratliff describes the demoscenes meritocracy as egalitarian, which I think is suitable for the demoscene today. But like many other social network, the demoscene maintains some forms of stratification, and even more so before 1996. One of the most clear manifestations of these hierarchies were the different *charts*: at demo parties there were competitions where the artifacts were ranked, usually by public voting. In *diskmags* (disk magazines) there were charts for groups, productions and individuals, and on the BBSs there were charts about up- and downloads. The practice of absolute measurements of quality dates back to cracking, as does the related distinction between *the elite* and the *lamers*. If you were elite you knew how to behave, how to talk (elite = eL17E), and how to produce (from scratch).

Communication Art Forms

Just as the demo had once grown out of the cracker scene, the communication channels of the demoscene spawned new artifacts, that on their turn developed their own subcultures. One example of such a subculture is for instance the *text-art scene*. Because a BBS was limited to text graphics, some graphicians specialized in making graphics in text mode (Ascii, Petscii, Atascii, Ansi, etc). These graphics were also released as stand alone *ascii collections* showing refined graffiti-inspired logotypes quite different from the generated text art common on the web today.

Another example is *chip music* – a music style built on the 8-bit sounds of old computers. Due to its minimal use of resources, coders and crackers were grateful since they could minimize the size and maximize the output. Musicians were also happy to work with these restrictions due to aesthetical or nostalgic reasons (Ratliff 2007). These songs opposed the developments towards more acoustic, 'real' sounds in digital music. So during the 1990s chip music became soundtracks for the demoscene and crack-intros, while today it has expanded into large festivals such as Blip Festival and communities such as 8bitcollective.org.

I think it is also worth considering *warez* as artifacts – the software that traders and swappers distributed. Like crackers tagged their cracks, swappers and sysops also tagged the wares they copied with their pseudonyms. Rehn (2001) describes this warez culture not as a gift economy completely opposed to capitalism but as a hybrid economy for honour and gifts, which also describes the demoscene. Trading is a *conspicuous production* which *"has no other (real) purpose than signifying the abilities of the producer"* (p.155).

Conclusions

Copyright made the demoscene because it is a subculture that grew out of the will to copy. Still, the importance of originality and ownership within the scene separates it from the common discourses of copyleft remix culture. It seems that the easy access to rather open artifacts made remixing less challenging and interesting, because of the aesthetical attitudes in the scene.

As a bounded culture with its dogmas in methodology, the demoscene would disregard of signifiers of style. A focus on craft can result in an increased tolerance for alternative styles; as long as there is good craftmanship it is, atleast partly, a good artifact. This seems to be a good starting point for a sustainable network culture.

Artifacts in the demoscene have nothing to do with money and everything to do with showing skills for a bounded culture, and are thus conspicuous productions. This is different from the digital communities that generate money to share holders or reach a wider audience. This is not to say that only demosceners can

appreciate demos or that demos never reached a wider audience (although it was rare). But it seems fair to assume that in general, especially before 1996, if someone obtained and liked demos, they were either part of the demoscene or planned to be. Demos were thus indistinguishable from the scene.

Today that has changed because the Internet has given easy access to the artifacts, and demos are maybe also more experimental and suitable for decontextualisation. The sustainability of the demoscene network is going to be tested by its online presence. Will it remain its boundaries? One indication of that is the controversy surrounding the hip hop producer Timbaland. When he sampled demoscene music in 2007 there were hostile reactions in the demoscene that used a discourse bordering to communitarian protectionism.

On the other hand, there are tendencies in digital art and pop culture that approaches demoscene methodologies by programming limited systems and engaging in low-level subversion of technology. There are experimental demos that include more interaction and generativity, which would bring them closer to the art world by emphasizing the difference from recorded artifacts.

There are demosceners that choose to still use 8-bit computers, in fact even more so than during the 1990s. There are new people joining, which I consider as cutting edge appropriation of technology rather than conservative nostalgia. Maybe what happens here is more media material than Kittler could ever imagine and more magical than any software that Cramer is aware of.

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RE:COPYing-IT-RIGHT AGAIN

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ABSTRACT: RE:COPYing-IT-RIGHT AGAIN addresses art-science-technology connections in Media Art from Chicago during the late 1960's and early 1970's. Artists, including Phil Morton (founder of the Video Area at The School of the Art Institute of Chicago) and Dan Sandin (founder of the Electronic Visualization Lab at the University of Illinois at Chicago), collaborated on realtime audio video projects that anticipated current New Media Art theorypractices as well as Open Source software and Free Culture. The School of the Art Institute of Chicago and The University of Illinois at Chicago acted as incubators for these communities, becoming internationally recognized homes of artistic experimentation and technological innovation. Artist-developers such as Phil Morton, Dan Sandin, Jane Veeder, Jamie Fenton, Larry Cuba, Ted Nelson, Tom DeFanti, Kate Horsfield, Lyn Blumenthal and Gene Youngblood connected in Chicago during this time. Creating projects that deeply influenced national and regional perspectives on Media Art, these Media Art Histories are still little known due to their radical, alternative, experimental and playful approaches. In 2007 I initiated the Phil Morton Memorial Research Archive, containing Phil Morton's "personal video databank" of materials documenting these histories. My presentation draws from this original research. KEYWORDS: Media Art Histories, Chicago, realtime, New Media Art, Open Source

Both Sean Cubitt and Lev Manovich have written introductions to their work that recognize the hybrid meshworks of connections, meanings, materials, histories and theorypractices of Video Art and New Media Art. In Videography: Video Media as Art and Culture, Cubitt wrote that Video and thereby Video Art are "at the heart of increasingly interlinked webs of previously separate media... neither an autonomous medium... nor entirely dependent on any one of them."[1] Ten years later, Manovich similarly wrote that the languages of New Media Art are "always hybrids, incorporating memories, expertise, and techniques of already well established cultural forms".[2] These quotes articulate together that Video Art and New Media Art histories are deeply interconnected, technosocially situated and culturally encoded.

Current New Media Art theorypractices have developed from the Media Art Histories of Video Art. the Video Art of the 1970's anticipated many specific New Media Art theorypractices. I trace these histories through the lens of experimental Media Art projects made in Chicago during the decade of the 1970's by a group of artists and academics whose deeply collaborative artistic research and development led to the establishment of new technologies, approaches, organizations and Media Art projects. Phil Morton, in particular, is the key in my study of this period. Morton acted as a major hub of interconnection in this group and importantly articulated ethical and theoretical positions of the groups that formed through these collaborations.

During the early 1970's, the work of Media Artists in Chicago anticipated and developed Open Source approaches to Free Culture, foregrounding collaborative experimentation. Phil Morton developed an approach called COPY-IT-RIGHT. COPY-IT-RIGHT is an ethical position that motivated the early Video Art communities in Chicago and beyond to share resources, to widely distribute media and create transparent, decentralized and open systems. In 1971 Dan Sandin developed The Sandin Image Processor, a patch-programmable analog computer optimized for video processing and synthesis. Morton, who was a friend and neighbor to Sandin, asked Sandin if he could build the first copy of Sandin's original Sandin Image Processor. Sandin and Morton then began to work together creating the schematic plans for the Sandin Image Processor from 1971 to 1973. They named this document The Distribution Religion. Sandin open sourced his invention, giving the schematic plans away for only the cost of the Xerox copies and postage while simultaneously incorporating any additions or modifications made by those who built their own Sandin Image Processors into any further releases of The Distribution Religion. This proto-Open Source project gave an international community of artists unprecedented abilities to process and perform realtime audio and video projects.

It was during this time Morton developed COPY-IT-RIGHT, the anti-copyright approach to making and freely sharing Media Art under which the plans to build Sandin Image Processors were released. The Distribution Religion and many of Morton's individual and collaborative Media Art projects were released under the COPY-IT-RIGHT license. COPY-IT-RIGHT encouraged people to make faithful copies, caring for and distributing Media Artworks as widely as possible. A close-knit community of collaborators worked together in Chicago on the New Media of their time, incorporating digital and analog computing with realtime audio and video synthesis, processing, computer programming and experimental improvised performance.

As Christine Tamblyn wrote in her 1991 essay "Image Processing in Chicago Video Art, 1970- 1980", these artists did not "market their work in conventional art contexts"[3] and were not concerned with traditional forms of commodification. They were, in fact, importantly opposed to these commodity forms as well as philosophically and ethically opposed to Intellectual Property Regimes and restrictive corporatist copyright law. They created and encouraged digital and analog systems of open collaboration and exchange. As Sandin told me in a 2003 interview, he felt that his role was to "create and disseminate information"[4] which is why he freely and openly gave away the plans to his Sandin Image Processor. Sandin states that he was and continues to be opposed to the ideas and approaches of commercial software in relation to New Media Art. he furthermore observes the connection between the early Video Art moment and current New Media Art particularly through the lens of Free & Open Source Software and Culture.

Morton vehemently advocated for Free Culture and Open Source approaches to Media Art before such terms were in use. He experimented relentlessly with boundaries, ignoring as many distinctions between personal, professional, political, aesthetic and technological categories as possible. He immediately moved to include analog and digital computing into his artistic work and academic curriculum with very few antecedents to rely on or refer to. In doing so he purposefully and playfully explored what we would now refer to as New Media Art, an art that was radically open, remixed, collaborative and conversational.

Morton wrote in his 1973 NOTES ON THE AESTHETICS OF 'copying-an-Image Processor' that: "First, it's okay to copy! Believe in the process of copying as much as you can; with all your heart is a good place to start – get into it as straight and honestly as possible. Copying is as good (I think better from this vector-view) as any other way of getting ,'there.' "[5] This position as articulated by Morton in The Distribution Religion constitutes an important aspect of his COPY-IT-RIGHT ethic, namely, that copying is right, morally correct and good. In fact, for Sandin and Morton, copying is not only good it is necessary for their process, for their project, because it was conceived of (conceptually and technically) as expandable, open, modular and decentralized.

Jane Veeder, who collaborated closely with Morton and Sandin, has explained that Morton's COPY-IT-RIGHT ethic came from an "early counterculture... sense that information should be free."[6] Veeder links Morton's position to current Digital Art and New Media as well as Free & Open Source Software development. As Veeder details, COPY-IT-RIGHT means making faithful copies, caring for and sharing work. As such, COPY-IT-RIGHT is an ethic, an ethical position. Lucinda Furlong wrote in her 1985 essay on the Video Art subgenre of Image Processing, that Sandin himself "got involved in video in 1970 during the student protests that resulted from the Kent State killings"[7] and so, like Morton, Sandin understood the medium of video and realtime Media Art to be importantly always already sociopolpitical rather than neutral. Sandin and Morton set out to mobilize critiques of economic power structures such as copyright, the singular authority of authorship, profit as a basis for creativity and technological hierarchies in their decentralized innovations and pedagogic projects. They understood their work, not only in terms of being personally and culturally transformative through technologies, but also importantly in the context of sociopolitical and economic struggle.

Veeder and Morton traveled the continental United States in a mobile Media Art lab built into a customized General Motors van. They engaged in "Videotape presentations, live Video and Computer Graphics performances, workshops, and/or any useful format of collaboration"[8] sharing these programs under the COPY-IT-RIGHT license. They referred to this project as the Electronic Visualization Center. Veeder has said of the Electronic Visualization Center that it was imaged to be parallel to and inspired by the Electronic

Visualization Lab that Sandin and DeFanti had created at the University of Illinois Chicago Circle Habitat or what became known as the Electronic Visualization Lab. As Media Art Historian Michael Century describes it, this group of people working at the Habitat/Electronic Visualization Lab was "a distinctly counter-cultural unit exploring the "phenomenology" of interactive imagery for use in experimental art and scientific visualization."[9]

Gene Youngblood explains that Morton and Veeder's artistic process of travel into the American West embodies a countercultural impulse. Over the course of their travels, Veeder and Morton created a series of programs, digital and analog electronic media, cyberpsychedelic road movies. In one such program, called Program #7 and made in 1978, Veeder and Morton combine Image Processed video that has been affected using the Sandin Image Processor with footage of traveling through the American West, diaristic voice overs, source code, game play, computer generated text and abstract patterning created with the Zgrass and the Bally BASIC system running on The Bally Arcade Video Game System. This material and aesthetic hybridity is a direct example of the hybrid meshwork that connects Video Art and New Media Art through their shared material and Media Art histories.

Jamie Fenton appears in and collaborated on Program #7. Fenton developed the ROM based operating system for the Bally Arcade Video Game System in 1977 in Chicago. At this time, Fenton also developed Bally BASIC, an interpreter for the widely used BASIC computer programming language. Fenton was also a developer of the Zgrass language for realtime computer animation which was a collaborative effort between DeFanti, Fenton and Donato during 1977 and 1978. Fenton was involved in early video game development and she contributed significantly to the field of arcade and home video games as well as going on the be a co-founder of MacroMind in 1985. She developed the authoring software MacroMind VideoWorks in 1985 which became MacroMedia Director in 1987. Director enabled countless artists to create what was known in the 1990's as "CD-Rom Art" or more generally "Multimedia", a precursor to current forms of New Media Art. This form flourished during the 1990's.

Many artists creating CD-ROM-based artworks at that time developed what Media Archeologist Erkki Huhtamo called "the archeological approach in media art".[10] Huhtamo identified this tendency in a number of artworks produced with the Director authoring software, listing in particular the work of Morton's former student Christine Tamblyn and her She Loves It, She Loves It Not: Women and Technology from 1993. In 1996, Huhtamo curated an exhibition of "CD-ROM Art" that included Tamblyn's project. Huhtamo wrote in his introduction to the exhibition that CD-ROM technology had by the time of his writing become a ubiquitous standard of personal computing and that artists where dealing with this technology in innovative ways and asking critical questions about the issues of distribution and access. Huhtamo also underscored the Media Art historical connection of this activity, writing that CD-ROM Art shared "similarities with the pioneering times of video art in the 1960's and 1970's."[11] One literal point of connection is Tamblyn herself who had been educated by Morton. Another significant but little documented connection is Fenton herself who had also been a part of the Chicago-based collaborative group of artist-educator-innovators discussed in this study. Tamblyn worked with the tools (Director) that Fenton developed and both had come out of the Chicago group working with Morton.

Morton and Veeder's Programs anticipated the development of the affordable and accessiblely designed personal computing that Ted Nelson advocated for in his Computer Lib/Dream Machines (which he self-published when he was roommates with DeFanti while living in Chicago and teaching at the University of Illinois at Chicago) or the multimedia authoring tools that Fenton would go on to develop. Morton and Veeder's ability to envision and anticipate these systems and the development of digital video in the 1990's or it's distribution online in the 2000's arises from their engagement in conversational Media Art projects that put them in direct communication with those who would go on to develop these tools and systems such as Nelson, Fenton, Gene Youngblood, Woody and Steina Vasulka. Their foresight also results from their optimistic early adoption of these systems and the influence they had on their students and collaborators, encouraging and as Youngblood asserts, articulating, for the first time, the philosophical and political urgencies of their ethical engagements with Media Art, such as Morton's COPY-IT-RIGHT ethic.

Morton and his collaborators were explicitly interested in and committed to constantly commingling the

concepts of Cybernetics, Psychedelics and countercultural positions on issues such as the socioeconomic and political power relations refied through and embedded in 'the technological' via their proto-New Media Art projects. Morton explained this to Youngblood by saying that they were transmitting themselves into "different worlds – perceptual, conceptual, physical, survival"[12] in order to "process those worlds electronically."[13] Veeder reflected on the imaging aspect of this process, saying that their projects include simulations of themselves and their desires. She told Youngblood: "We work hard out there every summer collecting documentation with which to simulate our desired future. And we do it electronically."[14] Morton continued this line of thinking saying that their project could be understood as "an imaginary model of us electronically visualizing ourselves so much more powerfully, a more powerful spell."[15] Morton's reference to spellcasting in the context of computing and electronic media points towards the transformational understanding of technology that was so critical to Morton and his collaborators. At a certain point in the interview Youngblood refers to their collaborative video projects as 'pieces' and Morton corrects his use of the term 'piece' saying: 'We don't make pieces... We make communiques and responses."[16] These communiques and responses were also directly aimed at corporations (such as General Motors) and conceived of as critiques of commodities, copyright and Intellectual Property.

As Janice T Pilch states in her essay "Collision or Coexistence? Copyright Law in the Digital Environment" intellectual property regimes are most "often associated with efforts to wipe out music and film piracy"[17] in terms of file sharing and copying of digital files online or in peer to peer networks. Morton's COPY-IT-RIGHT ethic was conceived of for the purpose of exactly this find of sharing, copying and exchange of Media Arts. Various forms of resistance to copyright have been identified by scholars such as Debora Jean Halbert. Halbert seeks to find and highlight the strengths of "alternatives to protecting knowledge resources that don't translate them into private property"[18] while investigating a number of areas of the legal expansion of copyright with a focus on the ways in which Intellectual Property regimes limit creativity while increasing suspicion. These limits and suspiscions result from the assumption that "creation stems from the chance of monetary rewards."[19] Morton and his Chicagobased group of collaborators and students, resisted this assumption and considered their creative work to be for the (moral, artistic, personal and political) good of their communities. As such, Halbert's search for alternatives and resistance to as well as critiques of copyright law and Intellectual Property regimes hold particular importance, underlining that the experimental work undertaken by these artistdevelopers is echoed in critical and scholarly analysis thirty years later. Over the course of these thirty years the issues of copyright and Intellectual Property in Media Arts become even more pressing as the digital forms that Morton and his collaborators developed and experimented with eventually became the basis by which almost all media is rendered, distributed and exchanged.

Halbert explains that as "solutions become increasingly draconian with each new lobbying round by major intellectual property interests"[20] and the conceptual framework of property is the main way in which creative work is enframed or understood more suspicion is produced. This suspicion has a destructive effect, causing people to worry about "how their work will be misused instead of used".[21] Rather than promoting a culture in which the creative arts are valued in frameworks other than property and artists are encouraged to freely exchange and share ideas, the United States Congress has enacted laws that further expand the definitions of copyright and Intellectual Property in favor of industries rather than individuals and in order to further protect corporate rather than public interests. Halbert plainly states that these laws are "not a neutral body of abstract principles, but is instead the codified will of those with economic and political power."[22]

Before definitions for the terms Open Source, Free Culture or New Media Art were used, circulated or understood, Phil Morton playfully experimented with remixological processes and projects that sprawled across these boundaries and borders. Morton's projects were not only transgressive in these terms, but also because they resisted commodification, copyright and Intellectual Property. Morton and his individual and collaborative works defend an ethic of openness shared by the Chicago-based group of collaborators. Alternative Media Art Histories can provide parallel historical accounts of forms of resistance to copyright in Media Art cultures and communities. At a time when transnational corporations have increasingly sought and received legal support for expanding the definition of copyright, Morton's COPY-IT-RIGHT makes clear that other worlds are possible. Or as Halbert writes, "we do have a choice in how the

future develops."[23] This future, in which these alternatives to copyright can exist and flourish, relies on a recognition and critical inclusion of under represented, repressed, lost or forgotten histories (such as the subject of this study) in order to establish the past upon which the future Halbert defends, a viable future of ideas, can be based.

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Visual Digitality: Towards Another Understanding

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ABSTRACT:

Given the assumption that the way an image is put together affects how we see it, this paper will seek to explore how art, image, photography and painting can be talked about since the advent of digital painting, especially in Asia. Faced with a composited image file that is located somewhere between the histories of painting and of photography, we need therefore to ask what exactly is the digital image. How do we as viewers from the age of film and photography come to the age of digital visuality, which is intrinsic to the vision of an Asian renaissance? The present trove of digital lexicon has gifted us with new metaphors to imagine this visuality: layering, channel operations, re-sizing, alpha channels and masking, etc. At the same time, we are, as mass-media consumers, seduced by the familiarity of its surface declaration and the seamless integration of disparate elements. Using examples of digital artwork from artists such as Jason Wee, Miao Xiaochun, Issei Yoshida, we ask if the logic and politics of representation has changed from the days of the disjunctive modernist avant-garde collage. Can we locate the impact of digitality in Asia through a newfound intractability of the digital image, which is situated within a necessary excavation of the profundity of its construction processes?

KEYWORDS:

Digital image; Asian artists; Digital lexicon; Originality, New media.

With the expanding lexicon of digitality, many words have been adopted or created to accommodate new methods of working with the digital medium. As such, a digital image which we might take for granted as innocently similar in its make up to a photograph or painting has its birth enabled through operations that have been technologically and thus conceptually differentiated. The accelerated rise and proliferation of digital tools in art making has meant that there is a lag in the material comprehension of the work. Perhaps as a defense against such ignorance we latch onto the subject matter as the primary way of explaining the image and we neglect the specific histories and processes that have informed the digital art object. The digital image demands now an archaeological examination that has previously been given to the treatment of artefacts. Hence, this paper begins by asking whether or not the concomitant development of the language of digital art has, or even should have, substantively affected the way we as artists and/or viewers approach the digital image. Our initial conclusion here is affirmative although we would like to restore an atmosphere of productive ambivalence to the ambit of the digital by teasing out its difficulties and contradictions. More interestingly, we find that such an elaboration has consequences also for the understanding of digital practices of Asian artists, some of whom might be paradoxically closer to the ethos of the digital.

The first question under consideration is that if a certain visual outcome is achievable via traditional means such as painting or photography, why then use the digital to create it? The lay viewer who comes to the digital image will not care too much about the essential differences between two images which look the same to the eye but really have quite distinct origins in their production. But for the interested audience, we can further proceed to ask what other meanings and ideas can be accrued by the insertion of the digital process? In short, one can even begin to say that the meaning of the digital image resides in the fabric of its making, a notion that had already been promulgated by process-orientated art from the 1970s. One thing about digital art is that it is given short shrift by the greater art historical establishment whose principal job is to investigate images. Art history views digital images with some suspicion as digital tools has popularly been seen as enabling swifter and relatively liberated ways of working and one that is less encumbered by history than say if an artist practices with a brush or a camera. Thus, the digital has been tarred by the

charge of expediency and disingenuity.[1] Yet as soon as the digital image begins to emulate or approximate traditional painting or photographic techniques (a tromphe l'oeil of sorts), the scenario actually becomes more complicated than first thought and throws into relief old chestnuts and biases about the category of art itself.

Digital art programs do have a democratic intent, allowing access and feasibility to a mass public, however, they also carry forth the misguided thinking that this ease of application is a constant case and that it contributes to the waning of originality when cut-and-paste is the modus operandi of this current generation.[2] It must be said here that no one has yet accused the collagists of high modernism to be lacking in originality and certainly a YouTube mash-up can exhibit more creativity than the source materials that go to make up its fabric. The digital artist is not someone who though in possession of a brilliant idea then dumbly sits down at his computer and presses buttons. But what pervades our appreciation of the digital is yet again the anxiety about creative genius, virtuosic skills and the necessity of a work of art to be a groundbreaking paradigm shifter. These aims have not been forsaken in digital art, only much harder to achieve in our postmodern age, and more importantly for our paper, we want to suggest that what needs to change is the ways we go about seeking and describing it. [3]

Also, the emphasis of this paper on the medium of digitality is not to rehash old modernist arguments about medium fidelity, autonomy and anti-mimesis, but rather to cast this gaze in a different direction. It is one closer to what Jacques Ranciere has proposed that we read as the true 'anti-mimetic aesthetic revolution', which is not a forswearing of resemblances or verisimilitude but a 'principle of "each to everyone else's"', the 'constitution of a shared surface in place of separate spheres of imitation'.[4] Therefore, to read off the digital medium in image making necessitates a relational thinking that partakes in the adjacent discourses of painting and photography.

For our purposes we have selected three Asian artists: Jason Wee (Singapore), Issei Yoshida (Japan) and Miao Xiaochun (China), all of whom have very different ways of working within the digital but each contributes to the problematic which we have identified above, namely that perceptual equivalence endowed in the image replicable in old media does not lead to conceptual equivalence. Each artist illustrates for us some of the key working methods available in digital art such as 'generating'; 'compositing'; 'rendering' and even 'painting'. The terms may look familiar but in the digital realm they describe a very particular menu function, and accordingly, these terms then supply the conceptual levers for the viewer to unlock the inner workings of the digital image. Compositing alludes to the work of 'cut-and-paste' from already available materials and to generate an image, one begins usually with a pre-given visual 'noise' made by algorithms where one can steer the general terms of the image but is not able to specify it. Creative control

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1 The ease with which digital objects can be multiplied draws many parallels with the act of printing and there is a similar rootlessness behind much of the decision making. When Mark Wallinger's video installation *Angel* was first shown at Anthony Reynold's in 1997 it was on a small monitor. In the same year it was shown at the 'Sensations' exhibition at the Royal Academy but as a large video projection.

2 The studio of the digital artist is also subsequently transformed, a multi-tasking space that can double as your entertainment station and keep you in contact with the outside world, quite unlike the connotations of the conventional studio as difficult and expensive to maintain, and often tiresome to get to.

3 The digital image does not always indicate an advance of art critical paradigms even if it uses the most advanced technologies but can rather present the informed viewer with a list of conundrums. For instance, the Duchampian mantra of dislodging the optical of retinal art is strangely reinforced and undermined all at the same time, if we think in terms of digitality as inserted within a linear progression of avant-gardist sentiments.

4 Jacques Ranciere, trans., Gregory Elliott, *The Future of the Image* (London and New York: Verso, 2007), 104-5. 'The anti-mimetic, modern aesthetic break is not a break with art that is a slave to resemblance. It is a break with a regime of art in which imitations were simultaneously autonomous and heteronomous: autonomous in that they constituted a sphere of verbal or visual creations not subject to the criteria of utility or truth operative elsewhere; heteronomous in so far as they imitated in their particular order – in particular, through the separation and hierarchy of genres – the social distribution of position and worth.' (106)

can be wrested back by the act of 'painting' or 'authoring' a digital image yet this by no means guarantees the desired outcomes or success of the picture as artistic intention contends with the controls of the program that can throw the image into disarray by an application of the artist's own accord. And certainly, the digital program in its rendering function is able to magnify and accentuate the degree of detail and complexity that is humanly achievable such that pictorial complexity supplants authorial control as the desired aim.

Our choice of Asian artists here is not to draw a conclusive arc about the Asian artists adoption of digital tools but rather because the surrounding, and often pejorative, discussion about copy and innovation in Asia usefully highlights the broader and similar responses to digital art, and also because in each of the artist's specific modes of working, they undercut our expectations about the place of the digital in their oeuvre and complexify the surface declaration of their images. Our three artists also share similarities in that they all produce two-dimensional, figurative, photographically-rooted prints, and their proximity to painting and photography serve to lever the associative terms of the digital into a territory that is unique but not self-sufficient.

THE ARTISTS AND THEIR WORKS

Between them these artists delineate the three possibilities on offer to a digital image maker: the generative, the composited and the authored though it is usual for an artist to employ more than one of these solutions. These strategies are each different in their nature yet the act of compositing brings them all seamlessly together within the same image.

Wee first started to take photographs as a way out of a writer's block (he was a poet) and his earlier black-and-white landscape photographs have a formal polish reminiscent of high modernist photographic practice. His recent work is entirely digital with his seascapes generated within a mathematical noise editor. This method is a distant cousin of the platonic solid: a mathematical expression that has been given shape and form. In his series *The Waters Of Indonesia Towards Australia*, Wee replicates the surface of a large body of water to the point of near verisimilitude, tricking our eye into the illusion of photography. Natural phenomenon such as coastlines, trees and the undulating surface of the sea all lend themselves very well to such mathematics. Yet even though in themselves they are astoundingly complex forms, the control the artist has over them is like the control a film director has over a crowd scene: general (able to determine its density, range, frequency etc) but not specific (able to place particular players in particular places).

In contrast, the images from Yoshida are themselves composed of many images that have been composited into a single image. Compositing is, at its most primitive, a simple cut and paste, but it will be obvious to anyone who has attempted to graft a picture of Madonna's head onto their grandmother's body that the result always requires extensive visual massaging before it can become convincing. This is usually done with digital paint and is analogous to the old-school authoring that a painter would do. Yoshida assembles his compositions from multiple sources mostly obtained via web searches but when need be, culls from his own photographs. These he renders seamless with skilled painterly intervention. Viewers cannot immediately apprehend the technological intervention here because they are busy working out the dense narratives of melancholic loss in Yoshida's images which are heavily influenced by a familiar nineteenth-century European romantic aesthetic.

Miao in his latest monochromatic series *The Last Judgment in Cyberspace* recreates old master paintings in a 3D program, populating his renderings with models of himself, replacing each of the 400 figures in Michelangelo's iconic work with his own image in correspondence to each pose and position in the original painting. He then moves the virtual camera into several vantage points so that it can grab an approximation of what Michelangelo would have seen in the Sistine Chapel had he shifted his point of view 20 metres over to one side. For all its technologised visage, there is something rather retrograde about the look of his piece that is out of step with the degree of accomplishment that the software can produce in the hands of digital aficionados. Miao's figures are relatively un-textured, his lighting perfunctory and his rendering basic. However, this unsophistication enforces the fact that these are digital artefacts and our gaze is consequently never entranced by duplicitous seamlessness.

WHITHER DIGITAL?

In each of the above cases, the 'generated', the 'composited' and the 'rendered' have not merely been the results of technical applications but also used as modifiers and addendum to what might be received as painted or photographed. For Miao, the appropriation of a wall painting into a digital domain has assisted in the interpretation of his vision of man's progression into a malevolent industrial dystopia and the verb 'to render' becomes a threat to painting, restoring the word's antiquated sense of submitting to inspection, to hand over or surrender.[5] This also feeds into the notion that rendering, as an operation 'surrendered' to the computer, is the handing over of artistic reins to an impersonal medium and yet multiplies the artist's precision and detail many times over. Miao, whose works are described as illustrating the evils of a technologised society, sits uneasily with technology, not as its celebrant but its adroit exploiter. Yoshida's compositing of photographs indicates that any attempt to insinuate the unity of its image will be a foreclosure as we are consistently made aware that its body is made up of constituents if we look hard enough, elements which can always return to subvert or destabilize meaning, where the intentionality of the source material can return to trump or haunt the newly composited work. Most intriguing of the three is Wee's subterfuge where the generated image (its facture simulating the photograph) from an antipodean technology is deployed to comment on another medium — photography. To 'generate' an image calls up an assumption that the visual product is externally derived (unlike the indexical quality of a photograph), its existence the result of a procedural performance of logical operations that can produce not a unique item but rather a set or sequence of items. Wee is not so much interested in the digital as how it can be used to query the taxonomy of photography and landscape, both recognisable only through its constructed elements (i.e. where things are placed) instead of content. The digitally generated nature of his process aids in Wee's exploration because digital ontology is aligned with the fact that he thinks the history of photography is also the history of modernity, and that Asia's experience of both these histories is through a series of fractures and interruptions parlayed via randomized foreign popular culture.[6]

Implicit within our analysis is the return of this anxiety with regards to medium identity, singular authorship and intentional control, which is prevalent in Western discourse and downplayed in Asian ones. 'To copy' and 'the copy' are not as disparaged in the East where quality of execution not originality holds an esteemed place. Painting, and to some extent, photography, assumes a Promethean nature of the artist, eager to verify the God-creator and the history that stands behind him/her, whereas digital art implies a guiltless appropriation and pure referencing. It might be now that we can state for digital art that 'God is in the edit', with the comfortable relinquishment of control through editing as the prime creative act (rather than authoring). Dispensing with the utopia of pixel-perfect intentionality, perfection and complexity are nonetheless easier to achieve in the digital and hence the almost evangelical pursuance of high-definition accuracy that is a pitched battle between program, familiarity and luck. So for the author/painter and the opportunist/photographer (who waits for the right moment) we now have a third stable mate: the editor/digital artist, who is never allowed to forget that his digital image is made from exogenous bits.

Fundamental to digital practice is its facilitation by *editing* software. This editing is not just in the fabric of the acquired material, it is in the editing of the many presets, templates and defaults that that are the controlling aspects of the software.[7] Thus, a piece of digital art is inherently the end result of many

5 A description of the work is as follows: 'Miao's photos conceive the celestial as a silvery futuristic tableau that's enchantingly serene and threateningly industrial. In combining the sublime awe of religious painting with malevolent science fiction theme, Miao uses photography to engage the viewer in an ultra-modern way. In using digital process to create his subject 'from scratch', Miao's photographs authenticate a virtual world rather than document reality. Similar to video game graphics and 'screen shots', Miao's images involve the viewer by casting them as 'avatars' within the action. Presenting his scenes at obscure angles, Miao positions the viewer as seraphs, saints, or in the case of *The Below View*, the damned.' Quoted from The Saatchi Gallery, http://www.saatchi-gallery.co.uk/artists/miao_xiaochun.htm.

6 Conversation with artist, 14 July 2009.

7 It is easy to forget that at its heart digital manipulation software is a manipulator of numbers (hence digital) and just as a mathematicians can perform in number-space operations that would be impossible in the real world, so this software can perform magic upon forms and behaviours at the same time as mimicking them: gravity can be inverted, movement can be converted into colour, colour can be converted into sound, negative lights can be shone upon an object to cast darkness upon them. However, this magic is heav-

edits which are driven by default actions and values such that its uniqueness is questionable at best. By functioning within default values, the digital artist is necessarily constrained by what was previously imputed; it is now not history per se that is the bugbear of the artist but the retention of the defaults the next time you open the program. The cost of this ease of use is twofold: that many of the creative decisions have already been made on the user's behalf and that the artist is removed from the numerical roots of his work (the 'digit' of digital art). A layering operation in Photoshop 1.0 required

an explicit awareness that an addition, multiplication or subtraction operation was in order. Since version 3.0 of Photoshop these decisions have been hidden from the user and they are faced with the altogether illusionary impression that they truly are layering one thing on top of another[8]. Though our three artists use three completely different programs it is, again, the vernacular of the edit that unites them all.

So digital artists find definition through the edit, yet is this taxonomy a useful one? The software might be an editor but that doesn't mean that the artist follows suit. It is possible that just as the artists are unsure, mistaken, or ambivalent as to how to describe themselves that they also are not using the software within the given limits of its nature. They have not been told that it is not a brush or a camera so they mistake it as such. Mediums are often used in a manner that goes against their inherent properties especially when that medium is still in its nascent form. Yet this mistakenness might rather be the nature of digital image making at the present. The fudged nature of the digital artist is such that artists who engage with digital practices still exhibit a reluctance to identify themselves as such. The author/painter and the opportunist/photographer are at two ends of the practice spectrum and digital art is not yet old enough for an artist to be able to come to it without a history in one or other of these practices. But despite having affiliations to both painting and photography, it is neither. It is of note that our three artists all have the roots of their practice in photography and their work frequently masquerade as photographs for the unsuspecting viewer.[9] Miao defines himself as a photographer and his work is often printed as c-prints (a photographic process) as opposed to the more usual inkjet (the traditional medium of the digital print) and Yoshida has come to his practice from early beginnings as a photographer and has even spent some time as a dealer of old cameras. Despite this he has said that he really does not mind what he is called, though he admits to a certain pleasure at being described as a digital painter.

The digital artist can be said to revel in this categorical fudge, his images registering not just contextual meaning but also the larger ontological and epistemological questions about the subject and object in the digital realm. Can a photographer be a photographer if no camera, developing fluids or photographic emulsion has been employed? Can the object be itself if no original constituent part of it remains? And if we regard painting as being an act of authorship (with the artist responsible for every nuance of form, colour and tone) and photography a taking advantage of opportunity (with the photographer waiting to chance upon the right optical configuration) then where along this line, or in tangent to it, does the digital image lie? Perhaps one answer to this would be to forgo such tired definitional contestations with the extant terrain and look to what the expanded lexicon of digital manufacture can bring to the interpretation of the digital image.

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ily tamed. Most digital manipulation software is consumer orientated, with much of the nitty-gritty elegantly hidden behind well-designed interfaces. In 1994 Adobe released Photoshop 3.0. The thing that made this program different to its predecessor was the ability to place separate images on top of each as layers. This simple facility was responsible for an explosion of interest in the software and in image manipulation in general. However, it offered nothing that Photoshop 1 and 2 did not already offer (a layering operation was possible through something called a channel operation) however its uniqueness was in making these things easier to do.

8 Transparency in a digital image is impossible as all colours are expressed as values between zero and one and that zero data (i.e. transparency) equates to black. The illusion of transparency is achieved through a simple mathematical operation called pre-multiplication.

9 When Wee showed his work in a recent group show of contemporary photographers he was nearly excluded when the organizers found out that his work was entirely digital in its fabric and manufacture. He successfully defended its inclusion by pointing out that his formal focus was the same and it mattered not how he addressed it.

Disarticulating the Artificial Female

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The fantasy of bringing to life the perfect artificially constructed female dates back to the myth of Pygmalion, most familiar in the work of Ovid. Part of his *Metamorphoses*—a collection of classic myths all with the common theme of transformation—the Roman poet describes a protean world in which all things are rendered digital in the hands of the gods. Pygmalion prays to the goddess Venus to bring to life Galatea, the woman that he has carved from ivory who is so perfect that he has fallen in love with her. Venus grants his wish and Galatea becomes flesh; she and Pygmalion are married and the two live happily ever after. Whether real or imaginary, the artificial female has, since Galatea, generally been read as the embodiment of a Pygmalionesque desire for either perfection or perfect verisimilitude, in relation to which she falls into one of two camps—"failed" and "successful" or utopic and dystopic—reflective of a binary attitude not only towards women (as either virgins or whores), but towards technology (as either a symbol of human progress or destruction) (See Huyssen 1986: 65-81). For example, Michelle E. Bloom, in her essay "Pygmalionesque Delusions and Illusions of Movement," traces "pygmalionesque desire" from the "'happily-ever-after' formula of Ovid's version" of the myth through its failure within the literature of the nineteenth century (in which female androids are common, but happy endings are rare) to its metamorphosis "at the end of the century into 'illusions of movement' made possible by the advent of cinema" (Bloom 2000: 291). As she notes, her primary interest is in the "longstanding human desire for the animation of the inanimate" for which cinema is a privileged site: "even when the Pygmalion paradigm fails in film, the medium itself succeeds in creating the illusion of movement" (Bloom 2000: 292). Bloom's thoughtful essay, however, glosses the "failed Galateas" of nineteenth century literature, as well as the femme-fatale androids and exploding fembots that became a common trope within twentieth century cinema, leaving the reader to wonder why "pygmalionesque desire" is so often thwarted.

In contrast, this paper focuses specifically on those Galateas, more properly understood as resistant rather than failed, who eschew verisimilitude and perfection and whose "mechanicity" is foregrounded. Such beings express a different set of desires than "successful Galateas," for they remain a borderline site suspended between contradictory states—the human and technological, animate and inanimate, perfection and imperfection, fantasy and reality. I will attempt to shed light on this contradictory state by focusing, in particular, on an internet fetish community that collectively fantasizes about mechanical humans. While some members of the group call themselves technosexuals, most refer to the fetish as ASFR, an acronym for alt.sex.fetish.robots, named after the now-defunct Usenet newsgroup where members originally congregated on-line. Although today A.S.F.R. tends to be associated most strongly with men who fantasize about robots, it is, in fact, a blanket designation for a range of different fetishes, which includes sexual attraction to mannequins, dolls, and sculpture, and even more so to real people acting like mannequins, puppets, wind-up dolls, or robots, or being frozen like statues or hypnotized. While all of these fetishes were explored on the original newsgroup, many of their fans later splintered off and founded websites geared to their specific interests. They do, however, still consider themselves to be "ASFRian" and acknowledge their point of common interest: the thematic of programmatic control—whether imagined as hypnotism, magic, a puppet master, or artificial intelligence—of a human object. When taken in this sense alone, A.S.F.R. strikes the imagination as a technological elaboration of standard BDSM (bondagedomination- sado-masochism) fantasies, in which one person dominates another for sexual pleasure. ASFRians are, in fact, sensitive to this interpretation of their fetish, as well as the perception that it represents the reification of normative gender ideals; for when many first hear about the fetish—myself included—they imagine that, for ASFRians, desire is contingent on replacing a human subject with a vacant Stepford Wife or Husband, who mindlessly fulfills the orders of its master, both sexual and domestic. Indeed, it is this common assumption about their fetish that, according to ASFRians, necessitates its obscurity and keeps its members highly closeted in comparison to fetishes like the Furries and Plushies (those who eroticize anthropomorphic and stuffed animals and animal costumes, respectively), who hold dozens of public conventions each year throughout the world. My own experiences, however, have led me to believe that not only is ASFRian fantasy more complex than

the desire simply to dominate or objectify, but that it has something to teach us about representations of gendered robots within popular culture.1

While it is somewhat difficult to generalize about the community (other than the fact that, with a small number of exceptions, it is predominantly male), the group itself makes a distinction between two (somewhat oppositional) tendencies, the first indicating the desire for a robot that is entirely artificial ("built") and the second devoted to the metamorphosis between the human and the robotic ("transformation"). There are, nevertheless, certain kinds of images and erotic practices that appeal to both groups and that appear repeatedly in relation to the fetish. For example, scenarios in which a real person is acting the part of a robot would likely be of interest to both groups, albeit for different reasons. Indeed, the majority of the ASFRians that I interviewed described their earliest fetishistic experiences as occurring while watching actors and actresses playing robots on such science fiction television shows as *The Twilight Zone*, *Outer Limits*, and *Star Trek*. Moreover, the primary indicators of mechanicity on such shows, which include silver and gold costuming and mechanical behavioral mannerisms like robotic speech, stilted movement, and repetitive motion, often enacted within moments of transition (such as when a robot is booted up, shut down, or programmed) are equally exciting to both groups. A large part of ASFRian activity revolves around the recreation in private of both the costuming and performances of these actor robots, giving the fetish a kind of do-it-yourself quality, on which Katherine Gates comments in her book *Deviant Desires*. Gates places A.S.F.R. alongside slash fandom as a group that appropriates science-fiction effects in homemade productions to their own erotic ends; ASFRians often write their own stories, create their own pictures, and construct their own robot costumes using shiny materials like latex, PVC, and Lycra to which they attach toys that "blink, bobble, and glow" in order to create the illusion of circuitry.

The emphasis on mechanicity complicates the relationship between ASFRian fantasy and the reality of artificial companions that achieve human verisimilitude; in fact, the state of tension and liminality—whether between the robotic and human or between control and loss of control, appearance and interior, motion and stasis—seems to have greater relevance to the fetish than the robot per se. As Gates notes, unmasking is a key aspect of the fetish, and many of the most exciting fantasies involve the sudden revelation of artificiality either through robotic malfunction—in which a human/robot gets caught in a repeat loop—or disassembly—in which a panel opens or a part is removed to reveal the circuitry beneath the semblance of humanity. While the latter is difficult to perform, ASFRians either search television and film for such 4 moments (which they then list obsessively on their websites) or they produce disassembly images themselves in the manner of ASFRian artist Kishin, who either renders them from scratch in a 3D program or adds exposed circuitry to figures from erotic magazines using Photoshop, a practice that some call "rasterbation." When I asked Kishin what it was about such imagery that he most enjoyed, he replied, "It's something about the contrast between the cold hard steel and the circuits and the wiring and the smooth skin and the soft flesh." The "come shot" for Kishin occurs when a female robot reaches up "to remove the mask that *is* her face" because "it's like a revelation of who she really is".

The question is: who is she (really)? In his essay "Fetishism" (1927), Freud tells us that in all cases, a fetish is "a substitute for the woman's (mother's) phallus, which the little boy once believed in and does not wish to forego" (Freud 1963: 205-206). It embodies an ambivalence, a double attitude towards female castration for which a compromise is struck by which the absent phallus is conjured elsewhere, a new point of erotic fixation that serves as both an acknowledgement and denial, "a sort of permanent memorial" that may manifest itself in a single part, like a foot, which the fetishist then worships, or a set of opposing attitudes that involve both hostility and reverence, such as "the Chinese custom of first mutilating a woman's foot and then revering it" (1963: 209). The ASFRian fetish object is, however, less a "permanent memorial" than a vacillating sign; it is, to use Freud's analogy, like mutilating one foot while keeping the other whole, an ongoing reminder that a deformation has occurred. To the extent that it attempts to assuage the ambivalence around an absence via a displaced presence, it also repetitively restages the exchange between presence and absence at this alternate location, re-enacting the trauma by which it was, theoretically, constituted. In this sense, it smacks of the compulsion to repeat that Freud links to the "death instinct." Indeed, there is a distinct similarity between the hiding and revealing of the mechanical interior

of the robot female in ASFRian fantasy and the compulsive throwing away and retrieving of the wooden reel by the child in the game *fort/da,* described by Freud in *Beyond the Pleasure Principle* (1961: 13-14).3 There is, moreover, a correspondence between repetition compulsion and what is being revealed—the "who she really is" of ASFRian fantasy—that is bound up less in technology per se than in automatism, the revelation of a force (imagined as programming by ASFRians) beyond the rational mind or conscious will that controls behavior, and that is brought to the fore in moments of robotic unveiling or breakdown. Gates argues that the automatism at the heart of the fetish is a metaphor for sexuality itself: "the sense that we have no control over it; that we respond mechanically to stimuli; and that our sexual programming makes us helpless. Fetishes, especially, are a kind of hard-wired sexual subroutine" (Gates 2000: 228). In this sense, A.S.F.R.—as an erotics of automatism—is a fetish whose object is, in part, a revelation of the compulsive mechanism of fetishism itself.

Read more generally, however, A.S.F.R. not only points to the slippage between the subject and object of fetishism, but to the ways in which the circuit between them is wired with both biological and cultural contact points, the exposure of which is potentially denaturalizing (for the object) and self-revelatory (for the subject). For example, while many ASFRians are fascinated by the film *The Stepford Wives* (1975; remade 2004), for many its primary interest resides less in the idea of the perfect housewife than in those scenes in which the Wives break down or become caught in a repeat loop—scenes beneath which foreboding music plays and that are intended to evoke horror. These are moments of vertiginous rupture that not only offer a glimpse of the robotic programming beneath the ideal exterior of the Wives, but also that throw into relief the cultural norms through which such ideals are constructed. Indeed, in the film, such scenes serve as feminist commentary on the extent to which real women (and men) have been socially programmed, and a connection is made in the original film between the domestic scripting of women and television advertising; many of the Stepford Wives speak as though they're actresses in commercials for household products.

It is, perhaps, of no small significance that ASFRians get particular pleasure out of scenes in which normative gender roles, as shaped by media imagery and embodied by the female android, are short-circuited. Most of the ASFRians that I interviewed came of age in the 1960s, '70s, and '80s, and while their fetish is a product of sf television shows, it is also a reaction to a historical and cultural moment in which mass consciousness was shaped by the centralizing force of television programming and advertising. Indeed, if the media in general, and television in particular, tend to codify normative social rules and behaviors, then science fiction stands out as a site at which the normal rules are suspended and other worlds are imagined that, in many cases, serve as a critique of and an alternative to the conventions of our own world. Although one might apply the stereotype of the sf geek to many ASFRians, the shared attributes that stood out in the men I interviewed were a high degree of sensitivity and self-consciousness coupled with social awkwardness and difficulty reading social cues.4 Puberty was, for these men, an unusually fraught time during which they felt both confused by and compelled to conform to the rules not only of social engagement, but also political correctness. Interestingly, many of the ASFRians that I interviewed considered themselves to be feminists —after all, many had come of age at the height of second wave feminism—but they expressed confusion about how to reconcile the way they were raised—i.e., "to respect women"—with their sexual impulses.

The female robot is, to some extent, a way out of the quandary: she represents the promise of a simplified playing field in which the rules of the game are programmed in advance, thus sidestepping social politics and eliminating the anxiety of making social mistakes. Within that simplified playing field, however, ASFRians imagine endless concatenations of possible moves, the erotic locus of which are moments of tension and rupture between opposite states—the human and the artificial, control and loss of control, exterior and interior. Such rupture is, I would argue, both a metaphor for and a condensation of the eruptive effects of adolescent desire on the socially-regulated body; it is a re-enactment of the tension between biological and social programming, between the chaotic flux of inner experience and the unified and controlled self as mandated by the social order. Moreover, to the extent that it is an attempt at their reconciliation, it is through recourse to a third category that has the potential to destabilize such dualisms as

self and other, subject and object, and even male and female.

Technology, in this sense, signals both the desire for and identification with an Other, a slippage made particularly apparent in one of the media examples cited most often as relevant to the fetish, an episode from the first season of *The Twilight Zone* entitled "The Lonely" (1959). The story takes place in the year 2046 on a barren and desolate asteroid nine million miles from earth, which serves as solitary confinement for a convicted criminal named James A. Corry. When the episode opens, a supply ship, which makes occasional visits to the planet, is arriving, and the captain, who has taken pity on the isolated prisoner, has left behind a box that he instructs Corry not to open until after the ship has departed. When Corry does open it, he finds a 7 lifelike female android named Alicia, programmed to keep him company. While at first he wants nothing to do with her, his need for companionship prevails and he starts to forget her mechanical nature and eventually falls in love with her. The next time the supply ship arrives, the captain informs Corry that he has been pardoned and can return home immediately. As the prisoner rushes excitedly towards the ship with his companion, however, the captain informs him that there is not enough room for the android. Corry argues with him, insisting that Alicia is not an android but a woman, *his* woman, but the captain stands firm and, in order to wake Corry up to reality, pulls out his gun and shoots Alicia in the face. In the final scene, the female android breaks down; her calls for Corry get slower and s-l-o-w-e-r as broken circuitry and loose wiring shoot off a few last sparks of life through the hole where her face had been.

The narrative climax of "The Lonely" corresponds with the primary visual triggers of ASFRian desire—breakdown, disassembly, and unmasking. The android's exposed inner workings are, however, not so much a revelation as a re-membering; Corry already knew that Alicia was a robot, and thus what lies behind her faceplate is integrally connected to the mechanism inside him that made him forget or, to put it in terms of the fetishistic relationship, that sustained his belief that she was a woman despite the knowledge that she was a robot. This visual reminder of his own psychic split is what Lacan calls the *objet petit a* or the *agalma* (by which he means a hidden yet alluring object that animates desire, but which is, notably, the Greek word for statue and the root of *agalmatophilia*, the term used by early sexologists to describe the fetishism of the inanimate). Lacan associates the *objet petit a* with the game *fort/da*, claiming that the spool on the string can best be understood not as a little mother, but as "a small part of the subject that detaches itself from him while still remaining his, still retained" (*Four* 62). Freud associates the return of the once familiar forgotten with the uncanny, an aesthetic term on which he elaborates psychoanalytically in reference to Hoffman's story "The Sandman," whose climactic scene—in which the eyes of the mechanical woman, Olympia, are removed and she is revealed as an automaton—bears a distinct resemblance to the climax of "The Lonely." Freud, however, dismisses the relevance of the android female in order to link the Uncanny to a psychological drive that overrides the pursuit of pleasure, which he will call the "death instinct" in *Beyond the Pleasure Principle*, a book that served as the impetus for his essay "On the Uncanny" (1919)—the latter was written between drafts of the former and published the year before. The fetishistic use of the uncanny android body by ASFRians thus raises questions about Freud's analysis that have relevance for the critical understanding of artificial bodies in popular culture both past and present. Moreover, it points towards the performative power of the body whose humanity is forever deferred, as well as the kinds of human pleasures it offers.

NOTES Note: This paper is an extract of the longer essay, "Technofetishism and the Uncanny Desires of A.S.F.R. (alt.sex.fetish.robots)" in *Science Fiction Studies Journal*, Volume 36, (November 2009), 404-438. 1 In 2001, I made a documentary short about the group, which can be viewed at: <http://www.ifilm.com/ifilmdetail/2408202>. 2 While a notable portion of the community is homosexual, all of the members with whom I communicated, are male and heterosexual, and so my descriptions should be considered most representative of their proclivities. 3 Freud describes a game, invented by his infant grandson for managing anxiety around the absence of his mother, which involves throwing away and retrieving a spool attached to a string while repeating "Fort!" and "Da!" (Gone! and There!). 4 It occurred to me more than once that A.S.F.R. might be related to a mild form of Asperger Syndrome. I was, therefore, not surprised when I read a passage in Katherine Gates's book in which she explains the appeal of the android Data on *Star Trek: The Next Generation* (whom she claims has gotten more erotic mail than any other *Star Trek* character,

Spock coming in second) for a female ASFRian she interviewed by referencing the autistic slaughterhouse designer and author of *Thinking in Pictures,* Temple Grandin, who also "feels close to him [Data] in his clumsy efforts to perform like a human, and in his urge to sort out the mystifyingly inconsistent rules of human social behavior" (Gates 2000: 228).

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Histories of live meetings - case study: five conferences on computer-generated art and related theories in Zagreb, 1968 – 1978

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Abstract:

Five international meetings of more than hundred artist and theoreticians of computer-based arts were held within the exhibition projects Tendencies 4 (1968 - 1969), Tendencies 5 (1973) and Tendencies 6 (1978) in Zagreb. The participants came from all sides of the world in peak of the Cold war. First two meetings in 1968 and 1969 hold the same title "Computers and visual research", where most of the papers were published in Bit International magazine (9 issues, 1968 – 1973). Audio archive (restored in 2007) shows different presentations and statements than one in later published papers. The social dynamics of the discussions is only readable within the audio archives.

The symposium 'The Rational and Irrational in Contemporary Art' (1973) was a unique place where participants from three artistic groups and accompanying theoreticians of concrete art and computer-generated art and conceptual art were engaged in an open dialogue that was, however, characterized by mutual misunderstanding. The reader published several papers and most of the abstracts but show little of the symposium's real content. The social dynamics of the past meetings and discussions are partly reconstructable by comining research of written documents (if they exist) but always in comparation with video or audio archives or oral histories of witness of the autherntic experience. The text format shows as not sufficent for the re-crating the whole picture or at least its majority. Audio archive is found and restored in 2007, and same as previous three presented at the "bit international. [New] tendencies - Computers and Visual research" exhibition in Neue galerie, Graz, 2007 and ZKM, Karlsruhe, 2008 – 2009, curated by Darko Fritz.

Keywords:
human networks, live meeting, histories of media art, New tendencies, Zagreb

In this multimedia presentation / paper I would like to stress the importance of the research on histories of face-to-face communication and live meetings of practicioners of art-and-science human networks. This is the critique of academic fethisization of text format, as often only source of research of histories of media art. The importance of the networks and not only artefacts and events is altready established in media art histories. Live face-to-face communication within the network provide social dynamics that is not comparable to any technologically mediated communication, even over last few years when real-time multimedia telecommunications reached certain standards, that are still in stage of the constant update with plenty of room for imporving. Such a social dynamics was necessary to create and improve social networks at both local and global level.

The case study will be inernational New Tendencies movement and network. Series of exhibitions, colloguys and symposiums and publications which were held under the terms of the New Tendencies, the New Tendency and the Tendencies (hereinafter jointly referred to as NT), in Zagreb and in other centres and locations for presentations, from 1961 to 1973, taking NT as a dynamic international network and a stage for different but unarguably advanced artistic theories and practices of the 1960s in the Gallery of Contemporary Art (which is today the Museum of Contemporary Art , Zagreb), within the Zagreb City Galleries, which organized five NT exhibitions in Zagreb from 1961 to 1973, while major exhibitions were also held in Paris, Venice and Leverkusen. NT presented different forms of (new) media arts of its time and constantly creating presentational and theoretical context within art histories of their days in dynamic flux.

German-Brazilian artist Almir Mavigner privatelly visited Zagreb in 1960 and via artist Ivan Picelj meet freelance art historian Matko Mestrovic. While having dinner in the Neboder restaurant they discussed recent Venece Biennale, both expressing disinterest for majority of the artworks presenteded. An exception were artworks by Piero Dorazio, where they recognized the rational approach in the visual program of his

hand-made paintings, unlike then dominant, abstract expresionism and informel. (1) Whitin this informal conversation out of any frame of institution the idea of organizing the international exhbition was born. We can know about such spontaneous and non-institutional historic event only by help of the oral history and interviews with participants, if the resarcher is lucky enough to contact the person or witness, if they are available and live. At non-western countries as then Yugoslavia was, mostly there are no written or recorded documents of the main body of the most interesting historic events, even if they have been presented ofcicially at institutionalized spaces. NT was an exception as they have recorded by photo, audio and text majority of their acitvities and archivized mostly all correspondence and related printed and audiovisual materials, safely stored in the archive of the Museum of Contemporary Art in Zagreb and several private archives.

The First Exhibition of NT in 1961 presented, as the very title suggests, the plurality of the avant-garde of the time, with a whole array of themes and subjects: neo-constructivist and concrete art, tautological and monochromatic painting and visual research through algorithm works. Movement and light were introduced as themes and materials, which would subsequently be focused on as the guideline of the following NT exhibition through the promotion of unstable media and (inter)active participation of the audience with the work of art, i.e. the result of the research. In exhibition catalogue, as well other NT exhibition catalogues that will follow, alongside reproductions of the artworks, theoretical texts and artists statements were published. Artist statements were short, as the following one by Francois Morellet:

> We are on the eve of a revolution in art which will be just as large as the one in the field of science. Therefore, common sense and the spirit of systematic research need to replace intuition and individualistic expression. (2)

During the days exhibition opening, participants, instigated by the unique meeting of like artists and theoreticians, spontaneously organized themselves into an international network, with the idea of continuing to organize biannual exhibitions. The crutial point in making decision to transgress the frame of the exhibition(s) and to act as international movement was crated in lively informal discussion that was held during the dinner at the restaurant Puntjarka (3). We suppose to recall the political importance of such face-to-face meeting meeting of Eastern and Western European artists as well Suthamerican emigrants in 1961, the peak of Cold War. Organizers noticed the importance of live meetings and each exhibition that will took place in next 17 years will be accompanied by live meetings in the form of round table, colloquy or symposium.

A larger group of artists met again in November 1962 in the Parisian studio of the GRAV group, while the next year of 1963 saw the ‘NT2’ exhibition taking place in Zagreb, now as an international movement, a podium for a profiled type of art of the new (industrial and focused on the future) era, which experiences itself as a social and artistic avant-garde that, through critical questioning of the visual, strives for social change, and which, through visual experiment and a positive stance towards science and the operation of machines, abolishes the notion of the complete – unique – work of art, thereby, just like earlier avant-garde movements, participating in abolishing art. The exhibition presents numerous works of programmed and kinetic art, while NT is profiled as the largest international exhibition and the most comprehensive network of this type of art. The catalogue of the second NT exhibition (1963) features a text by Matko Mestrovic, which was later revealingly dubbed the ‘Ideology of New Tendencies’, which it surely is according to its programmatic and theoretical structure. Demythologization of art and demystification of the creative process are also proclaimed through a positive approach to the industrial production of works of art (the possibilities of multiplication so essential), team work and a rational approach. Mestrovic calls for speeding up the evolution and synthesis of science and art, within the framework of rendering humanities and art more scientific, as part of the long-term (utopian) process of the overall rendering of all human activity into science. Mestrovic considers that this process can be actively started within the framework of art immediately, ditto for the display of a global model, striving to act in the sphere of culture using a smaller scale, e.g. through the appropriation of scientific methods such as the experiment. The problems of scheduling all material and spiritual goods in equal measure and the return of scientific results into the public domain emerge. He does not see NT works as unique goods for the artistic market, but as *‘plastic-visual research that strives to determine objective psycho-physical bases of the plastic phenomenon and visual*

perception, thereby excluding any possibility of involving subjectivism, individualism and Romanticism...'(4) Further, the thesis on the final surpassing of art as we know it was developed, through developing the conscience of the world using a metamorphosis of the social into the artistic act, which actively transforms the whole world.

The 'NT2' exhibition held in Venice had a different title than the 'NT2' in Zagreb a year earlier. The New Tendencies changed their name to the New Tendency (singular), as was explained only two years later, since the singular was also accepted for the following, Zagreb exhibition in 1965*, 'because of the striving for the conceptual concentration of intentions and joint ideas'*. (4) The clash between different factions within the NT movement also created the labelling of 'correct' and 'non-correct' artworks, according to ever stricter formal criteria. The democratic characteristics of the first NT exhibition were replaced by a dogmatic (focused, single view) approach, presented and enforced on behalf of progress and the consistency of artistic ideas. It was a time of circular letters that one group sent to all participants of the network, sometimes resulting in strong conflists of interest. Maybe situation will be better if some face-to-face meetings of all participants took place. What with inflexibility, the lack of compromise as far as ideas are concerned, but surely on account of the lack of a democratic model of communication within the undetermined hierarchy of the movement, which understands itself as democratic and expands at the same time to increasing numbers of participants, NT faced an internal crisis and numerous squabbles in the mid- 1960s. From the outside, the ideas of NT entered the mainstream and were reshaped using simplifications, while their social engagement, once at the forefront, was being neglected. The symptoms stated can also be discerned in case of the 'Responsive Eye' exhibition, held in the Museum of Modern Art in New York in 1965, in which numerous NT artists participated as well; however, but their work was immersed in the commercial context focussed more on retinal effects that the social dimension of artistic work (after this exhibition, the term 'op art' appeared). Many artists, as they gained international recognition,rendered their own style in commercial directions and blended into the commercial system of the culture industry, which they had often severely criticized earlier.

By 1965 the NT movement perceived itself in a state of crisis. The NT movement, which staged itself as "avant-garde", suffered in feeling immersed in the "visual art culture of the establishment of the bourgeois world"4. It had been caught by surprise by its international success as 'Op Art'. Therefore its members decided, after a colloquy at Brezovica with Abraham Moles during "NT3" (6), to make a *"new effort of organized penetration into the unknown"*, to dare the *"leap into a new, lively, fruitful stage of symbiosis with the machines"* (7), the computers. One of the curators, Radoslav Putar, writes that the approach to the machines is marked by principles, which *"have characterized the NT since the beginning"*. He highlights the concept of "programming" as well as the "exclusion of subjectivity". *"Even before the sixties K[arl] Gerstner spoke about the programming of procedures of encoding of picture elements; U[li] Pohl spoke about the anonymity and the exclusion of subjectivity during the NT-2"* (8).

Within the two-year 'Tendencies 4' event, during 1968 and 1969, a series of exhibitions and symposiums were held under the title of 'Computers and Visual Research'(9). The peak of complexity of the organization of NT was reached during the 'Tendencies 4', which, following detailed preparations, was realized in the form of 14 circular mails – newsletters (PI – Programme of Information), a panelled competition, six international exhibitions, realization of the computer-generated light installation in public space, two symposiums, the initiation and publication of the initial three issues of the bilingual magazine Bit International and finally by publishing the exhibition catalogue. Both colloguy from 1968 and symposium from 1969 that hold the same title "Computers and visual research", were simoultaneously translated to four languages (Croatian, English, French, Italian and German were in use). Most of the readed papers were published in two dedicated issues of Bit International magazine (total of 9 issues, 1968 – 1973). as well as selected parts of the discussion. The leading discourse on computers and visual research was the information aesthetics developed by Max Bense and Abraham Moles (10). Probably most interesting parts of reproduced tekst from the 1968 colloguy is transcripted discussion, an answer of computer artist Frrieder Nake on the paper by concrete artist Alberto Biasi concerning statements on political angagement and computers in the light of 1968 political and artistic context (11). Audio recordings of the symposium shows some different

presentations and statements than one in later published papers, but such a detailed comparation requires dedicated space that exceed space of this paper.

In 1973, 'Tendencies 5' exhibition cosnist of three parts: "constructive visual research", "computer visual research" and "conceptual art". Unlike the exhibition that presented artworks only, the symposium was a podium that included presentation of art historians and theoreticians and other scientists alongside artists talks. The proceedings of the accompanying symposium, on the topic "The Rational and the Irrational in Visual Research Today", and in the catalogue are evidence of a disinterest and blindness between constructive and computer visual research on the one hand and conceptual art on the other. Such three groups of artists and related theoreticians never before and never after in world's (art) history had oportunity to exhibit together and confront their ideas in live meeting. It was the concept of NT organizers to stage such a meeting, trying to bridge the gap between compeeting art practices of their time. Radoslav Putar, the Director of the Zagreb City Gallery and President of the Organizing Committee of "Tendencies 5", used the term "data processing" to describe methods of conceptual art. (12) Computer artists Frieder Nake established a similarity between computer and conceptual art on the level of "separation of head and hand" (13), criticizing it for being a production structure following the logic of capitalism. Such examples of bridging the generation and aesthetic gap were rare by other participants in the symposium. Even, majority of artist from the "constructive visual research" part of the exhbition did not took part in discussion at all, some of them declaring that they boycot the event in general, but only participate in the exhbition for the sake of "good old times", reffering to the importance of the New Tendencies as international movement of neoconstructive and concrete artists form the beginning 1960s, a decade earlier. Artist of both art practices, Waldemar Cordeiro staged that computer art had replaced constructivist art (14). He was one of rare cosnstructive artist that participate in early NT network that made use of computers.. From historical distance we can see that that conceptual art replaced both constructive and computer art in domnant visual art disource, starting from particular time of 1973 several decades onward. Exhibition's curatos from Zagreb Radoslav Putar and Boris Kelemen were underlining the importance of constructive and computer visual research, while the introductions to the concept art sections by Nena Dimitrijevic and Marijan Susovski revealed the situation in Zagreb by 1973: it is the time of the "post-object", the "non-formal", the "non-visual" (15). NT was perceived as a far precursor that had separated the idea from its execution, but had been "still involved in the material and visual sphere". Conceptual art, in this sense, was beyond "the scope of the New Tendencies". (16) In symposium's reader several texts are missing and abstracts only are published. But, luckily we have today an audio archive of entire conference available that show us that the printed reader cant't represent the importance of such a meeting and don't show its real contents.

The 'Tendencies 6' event was not fully held, just its part of the symposium Art and Society, in 1978. no verified and complete list of speakers were found, only very few papers and abstracts. From the symposium title we can be read as the idea of the organizers to question social issues still remaining present, but artistic practice and the contemporary new tendencies predominantly tended to the side of conceptual art, which would mark itself as the dominant discourse, and continuously set new canons of contemporary art for decades to come.

Audio recordings of four symposiums held 1968 – 1973 are found in 2005 as series of mostly non-signed magnetic tapes. At different corner of NT archive several list of speakers were found. The magnetic tapes are restored and digitalized and lineup of speakers recognized in Sherlok Holmes alike actions in 2007. "Art and Computers 71" conference took part in 1971, but no reader or papers were published. It almost completely skipped form the history as it is only mentioned in short report in Page magazine and mentioned in text by Boris Kelemen in Tendencies 5 exhibition catalogue. The photos from the archives were finally put into the right context and list of speakers reconstructed and aligned with audio recordings.

This audio archives are finally presented as part of the "bit international. [New] tendencies - Computers and Visual research" exhibition in Neue galerie, Graz, 2007 and ZKM, Karlsruhe, 2008 – 2009, curated by Darko Fritz. Presenting such material within the format of the exhbition helps a lot to phisically present the theoretical frame of NT and the idea of the international network of this time, not only the artworks,

as museums often tend to fetishize sole artworks. As well, the working process of particular artwork were presented next to the object, as flow diagrams, computer programs and alike providing another leyer of context.

During the organizing process and realization of NT activities different kind of written communication was in use: personal handwritten notes, typewritten letters with carbon copies, circular (news)letters that were distributed by post, call for works, application forms, and finally printed catalogues and Bit international magazine. Considering early digital art, Zagreb Museum is one of the ratre institution in the world that was organizing related acitvities on long-term base, and therefore an archivist's and researchers's pearl. Editors of NT publications were concusses of imprtance of live meetings, and apart of organizing it, they took care of dcumneting it in photo format and published in their publications, as well as pubishing the papers and making audio archives.

We can conclude only that the social dynamics of the past meetings and discussions are partly reconstructable by comining research of written documents (if they exist) but always in comparation with video or audio archives or oral histories of witness of the autherntic experience. The text format shows as not sufficent for the re-crating the whole picture or at least its majority. One step beyond this paper will be the the histtories of informal and private live meetings of media art practicioners. It is not rare that both informal communication during the breaks of the conferences in one hand and often too short oficial discussions at other, are more creative and productive than staged panels that reminds in text format. Even today, wth all easily accsesabe audiovisual aparratus, even (new) media conferences often leaving only text format into the heritage for the future researchers.

Footnotes:

1 Interviews by Darko Fritz with Ivan Picelj and Matko Mestrovic, audio, 2004
2 Francois Morellet: without title, Cat. Nove tendencije 2, Zagreb: Galerija Suvremene Umjetnosti 1961, n. p..
3 ibid as 1
4 Matko Meštrović, Untitled, *New Tendencies 2*, the catalogue, 1963. Published subsequently under the title of 'The Ideology of New Tendencies' in the book Matko Meštrović: *From the Particular to the General,* Mladost, Zagreb, 1967, and DAF,
Zagreb, 2005. Also cf. the essay by Matko Meštrović: 'Rendering Scientific as the Condition for Humanization', the text from 1963 published in *From the Particula to the General,* Mladost, Zagreb, 1967, and DAF, Zagreb, 2005.
5 Cat. Nove tendencije 2, Zagreb: Galerija Suvremene Umjetnosti 1963, n. p.
6 "Moles spoke so persuasively of the need to apply the theory of information and the Neumann-Morgenstern theories, and of the need to use computers in further research", see Bozo Bek, without title, in: Cat. Tendencije 5, Zagreb: Galerija Suvremene Umjetnosti 1973, n. p.
7 Radoslav Putar, without title, Cat. Tendencije 4, Zagreb: Galerija Suvremene Umjetnosti 1970, n. p.
8 ibid.
9 Regarding computer visual research in NT, cf. Herbert W. Franke: *'New Tendencies in Zagreb'*, in Thobias Hoffman and Rasmus Kleine [eds.]: *Die NeuenTendenzen - Eine europäische Künsterbewegung 1961-1973,* Museum für Konkrete Kunst, Ingoldstadt, 2006. and Darko Fritz: 'Amnesia International' in *I am still Alive*, Mi2, Zagreb, 2000, and 'Amnesia International - Early Computer Art and the Tendencies Movement' in *Bitomatik - Art Practice in the Time of Information/Media Domination,* kuda.org, Novi Sad, 2004.
10 The first two issues of the magazine *Bit International* are almost completely dedicated to the same problems and authors. Also cf.: Cristoph Klütsch: 'Computer Graphic-Aesthetic Experiments between Two Cultures', *Leonardo*, vol. 40, no. 5, pp. 432 - 425, 2007.
11 Alberto Biasi, Situazione 1967 and Frieder Nake, Replik an A. Biasi, in: *bit international 3*, Zagreb: Galerije grada Zagreba 1968, p. 29-39.
12 Radoslav Putar, without title, in: Cat. Tendencije 5, Zagreb: Galerija suvremene umjetnosti, 1973, n. p.
13 Frieder Nake, "The Separation of Hand and Head in "Computer Art" (1973), 9 pages, in: "The Rational

and Irrational in Visual Research Today"paper read at "The Rational and Irrational in Visual Research Today / Match of Ideas," Symposium T–5, 2 June 1973, Zagreb, published in the symposium reader 9 pages, Zagreb: Gallery of Contemporary Art, 1973, n.p.
14 "Constructive art belongs to the past, its contents corresponding to the Paleocibernetic Period being those of the Computer Art." Waldemar Cordeiro, "Analogical and/or Digital Art," paper read at "The Rational and Irrational in Visual Research Today / Match of Ideas," Symposium T–5, 2 June 1973, Zagreb. Abstract published in the symposium reader (Zagreb: Gallery of Contemporary Art, 1973) n.p.Cordeiro exhibited his works in NT exhibitions in Zagreb in 1965, 1969 and 1973, and participated in two related symposia in 1969 and 1973.
15 Nena Dimitrijevic, without title, in: Cat. Tendencije 5, Zagreb: Galerija suvremene umjetnosti, 1973, n. p.
16 Marijan Susovski, without title, in: Cat. Tendencije 5, Zagreb: Galerija suvremene umjetnosti, 1973, n. p.

Darko Fritz curated numerous exhibitions including "*I am Still Alive" (1960s computer-generated art and recent low-tech and internet art)*, Zagreb, 2000 and "*Bit International - Computers and Visual Research, [New] Tendencies, Zagreb 1961—1973"*, Neue Galerie, Graz, 2007 and ZKM, Karlsruhe, 2008. He has presented research on early digital art at various conferences, including *ISEA* 2000, Paris, 2000 and Helsinki, 2004; *End Repeat* ,Tallin, 2001; *Stuttgart 1960, Computer in Theorie und Kunst*, Stuttgart, 2004; *REFRESH!,* Banff, 2005*; RE:PLACE*, Berlin, 2007; *Programmation orienntee art 2*, Paris Sorbonne, 2007 and *Second Bremen Symposium on Early Digital Art*, Bremen, 2008. At Culturenet portal he published "*A Brief Overview of Media Art in Croatia (Since the 1960s)"* and **edited related database** in 2002. He published "*Amnesia International - Early computer art and [New] Tendencies movement*" at the Bitomatik by kuda.org, Novi Sad in 2004 and "*Vladimir Bonačić"* at the Leonardo magazine in 2008.

postvinyl

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Abstract:

The history of audio-records, record players and DJs had its ups and downs during the last 6 decades. Vinyl records had their first appearances in the 1940ies, seemed to have gone in the 80ies and reappeared gloriously in the 90ies DJ culture. The re-emergences of a medium is investigated from a media arts historical background and analysed in terms of "media cannibalism", hybrid forms of media, and "media mimicry".

Particular interest is given to a computer game about vinyl records: The media-archeological First Person Shooter Game "postvinyl" re-enacts record playing as a game based activity. The Virtual DJ is bound to start and stop records, change tracks and recontextualize record cover graphics and vinyl record surfaces.

The computer game "postvinyl" provides a DJ with the tools to control the visuals and the soundscape of a game art performance via an "Unreal Tournament" modification. Non-standard output devices like MIDI samplers, stage lighting and fogmachines can be controlled live via a computer game which becomes the interface for a DJ/ VJ. "postvinyl" is a game which plays on the ludic elements of live stage performance and a carefully conceived narrative on the history of vinyl records from 1949 to 2007.

Keywords:
Computer-aided DJing, Creative Games, Serious Games, Ubiquitious Computing, Ludology

postvinyl: A Narrative on Vinyl Records

The "postvinyl" computergame, a modification of the "Unreal" First Person Shooter, is a musician's tool to perform in a 3D environment, populated with vinyl records and the music they contain. It can be seen as a synthesizer for sonic art or as a narrative on the history of vinyl records. On one hand the game might be described as "ludic" in the sense of how Gonzalo Frasca introduced the term. On the other hand it might also be described as "narrative" in the sense of Henry Jenkins' definition of games [Jenkins, 2006] - as opposed to the understanding of the ludologist theoretical position [Eskelinen and Koskimaa, 1999] [Arseth, 1997]. Obviously the game contains a strong narrative component. The ludic elements are played upon in the improvisational musical sections of the game level, whereas the narration unfolds when walking through rooms and corridors containing signs signifying milestones of vinyl record history. As Sean Cubitt put it, narrative can be marginal and vital for a game. [Cubitt, 2002] This is perfectly true in the case of "postvinyl". The game can be enjoyed without reading the narrative. In this case the game is just an action-based 3D environment. It can however also been read (and played) as a 3-dimensional storybook. The story told in "postvinyl" starts in 1949 when RCA Victor introduced the 7-inch 45 rpm micro-groove vinyl single and compatible turn table. In 1949 Capitol became the first major label to support all three recording speeds of 78, 45, 33-1/3 rpm in the same year in Jamaica, sound systems developed playing the latest in R 'n' B 45s. The "postvinyl" story includes collectors' item records, extremely rare recordings and popular vinyls like "Hotel California" by the Eagles or "Kiss" by Prince. "postvinyl" also contains music from vinyls which have been recently published by DJs who rediscoverd vinyl after the alleged death of vinyl.

The Second Life of New Media

First "Video killed the Radio Star", then the interactive media made video look blunt, and now computer games seem to be more sexy than any other medium ever has been.
The art community usually celebrates the advent of a new media with the proposition that:

1) artists have invented the media
2) that they know better what to do with the media and
3) that they can tell the future of the media

This happened with photography in the 19th century, with William Henry Fox Talbot having coined the phrase "art of fixing a shadow" to describe his invention of the negative-positive photographic process in 1839. The technology of photography was turned into the art of photography. It happened again with video, Nam June Paik, Woody and Steina Vasulka amongst others, having been declared video pioneers. Video became video art. It happened once more with electronic music: The contemporary grandmasters of electronica couldn't help paying tribute to the early hisses and scratches of the likes of Pierre Henry and Pierre Schaeffer. Even Kraftwerk pointed out how important Karlheinz Stockhausen was for their music. Something very similar is going on in the world of computer and video games. There is a new beast out there, called game art. I want to suggest in this essay that:

1) artists have not invented computer games
2) that they know better what to do with computer games and
3) that they can live from the past and build the future of games

Cannibalism

In the same way video art cannibalized television, and photography cannibalized painting, game art lives on the remainders of mainstream computer games. Cory Arcangel's "Super Mario Clouds v2k3" piece from 2002, is a hardware modification of the Super Mario game for the Nintendo NES console.

Arcangel removed the main character, the friendly Italian plumber, and left the white clouds on blue skies to be watched by us. The artistic strategy of appropriation mixed with reduction is well known in other genres.

Martin Arnold, an Austrian filmmaker based in the US today, took a similar approach to historic black and white movies when he removed characters from Hollywood film material to show backgrounds rather then main actors. His filmic production "Deanimated", based on an American horror film from 1941, is built around careful reduction of foreground characters and shows us the backgrounds of the original black and white movie in all their glory. In both cases, Arcangel and Arnold, the artists spent enormous amounts of creativity, time and conceptual thinking on getting rid of what the original valued the most. Cory Arcangel had to become an expert in hardware modifications, and Martin Arnold had to learn and use a new software tool for months to rearrange the cannibalized material.

Let's look at another example: The PainStation by German game art group, //////////fur////, is an ironic comment on the SONY PlayStation. Cannibalizing the Playstation name and trademark, it ironically comments on play and pain. The game console they designed contains a modification of the historic Pong game. The famous game where white paddles on a black background push a square ball from one side of the computer screen to the other, has been set as a starting point for the Painstation set-up. The artists connected the scoring information of the simple game to electronic circuitry, making an electric current run through the player's hands. The level of voltage of the electric punishment increases with the score of the opponent. This playfully sadistic element of the game is accompanied by additional physical torture of the gamers. Apart from the entertaining aspects of the installation, Fur cleverly incorporate media history and game archaeology into their piece by cannibalizing forerunners of the genre. It is Atari's Pong and SONY's PlayStation which serve as a ferment of the innovative playstation game. Everybody understood the artistic reference and the pun on the PlayStation name, except for SONY Computer Entertainment Corp, who sued the artists for making improper use of their Logo. The artists somehow got away with it, they were forced, however, to change the typeface used for the PainStation in order to avoid "blurring the identity of the text-image brand". Tilman Reif, one of the //////////fur//// artists, reports that in their reply to SONY they explained that they merely worked according to SONY's "go create" slogan, an idea which the marketing department obviously invented with little reference to the legal department's practice. In retrospective, one

can be as happy as astonished about the fact, that Andy Warhol didn't run into problems with the Coca Cola Company and Campbell's Soups.

Remix and Hybridization

Popular media interact with each other and with elements of social and cultural fields with little respect to consistency or inner logic. So does media art. It has often been observed that television cross-bred with religion and advertisement, with furniture design and the food industry. TV-dinners and TV-preachers are remixes (we could also call them bastards in a positive Deleuzian sense), not originating from a logic inherent to the media, but from the ruthless desire of the television medium to reach out into foreign terrain. Mobile phones, which serve as flashlights or as alarm clocks do the same thing. Refrigerators made in the Loewy design and style, construct weird and irrational hybrids between a hot steam engine and a cooler to keep food cold. Game artists merge cultural fields in order to surprise their audience and in order to cast light on hidden relationships between seemingly unrelated fields.

"postvinyl" is a game, that borrows from and mixes audio technologies, rock music appeal and art history. The game feeds the sound output into a network of guitar effect panels, consisting of phasers, wah-wahs and delays. The gamer simultaneously becomes a player of the game and player of the music. His trigger finger follows the rules of gaming, but his feet control crazy distortions as if he was on a rock stage.

This game – postvinyl – plays the game of hybridization on two levels. On a hardware level it is a hybrid of a digital computer with analogue sound modifications, content wise it is a hybrid of an exploratory 3D shooter with the tunnels and corridors of a DJ performance set-up. The users have to slip into the role of a virtual DJ who can start and stop vinyl records by jumping on the record players, picking up records and placing them on turntables. The users can also look for custom-built sound guns, i.e. weapons that allow for the placement of spatialized sound sources in the performance environment. In this regard, the game once more cannibalizes commercial mainstream games: the concept of the weapon is taken up and transformed into a musical instrument.

Media Mimicry

Jim Morrison stated: "The old get older, and the young get stronger – may take a week and it may take longer" and saying such he was talking about a generation of young people but also talking about a medium – Rock Music – rebelling against predecessors in music. The young media tend to mimic and then take revenge on the old media. Games imitate and make fun of video, video hates radio, radio hates theatre … Martin Arnold calls "Deanimated", a movie mentioned earlier, a "revenge on film history" and shows his admiration as well as his critically subversive attitude in taking the old material serious. Media mimicry does not mean that the old media are overwritten, but that they are kept alive and in remembrance by mocking about them. One of the most interesting exhibition in the field of game art, "Mythos Pong" at Württembergischer Kunstverein in Stuttgart, is an hommage to the computergame classic Pong. The famous white paddles which allowed the players to bounce a white square across the screen have influenced a large group of artists. Remake-, replay- and revenge-pieces about the simple ATARI game have been conceived by such as Valie Export, Blinkenlights Project, //////////fur////, the ASCII Art Ensemble, Time's Up and Niklas Roy

Artistic revenge on a predecessor medium is a give and take. It adds to the predecessor new technology, new storylines, new aesthetics and new content, but it rips the predecessor of its charme, its history and its mythical suggestive power. When Niklas Roy transforms Pong into an electro-mechanical device with a shiny colourful outfit, he certainly enriches the old black and white 2D game. He adds a new dimension, he adds mechanics to electronics, he adds design to simple functionality. At the same time he takes from the old feeble Pong predecessor. He is able to suck the blood and heartbeat of an old machine from the dead body of Nolan Bushnell's Pong, he time-warps it from the past into the present and lives on the bones and spine of a 1972 machine in the year of 2006. This is media vampyrism at its best. It is not plagiarism, it is not a simple hommage, and not at all a variation on a theme. It is the transfer of historic added value on art and technology into a contemporary piece. This process is a step in an infinite process of appropriation, which will never end. Like Dracula, the artist-vampyr is never satisfied. His creatures become prey of other

vampires and the process of extraction – creation goes on forever.

Technology

Recently developed features of "postvinyl" allows us to control room lighting (of the physical space) or other MIDI controlled equipment like fog machines and wind machines via the Unreal Engine. This feature has not yet been shown in public, but has been thoroughly tested and will enhance the immersive character of the game performance immensely.

Technically speaking the game is a real time VJ tool with stereo sound output and MIDI control add-ons. The visuals of the game are designed for stage performance and corresponding lighting conditions. Gameplay events like entering a new room, shooting a record on a record player or running through windy landscapes is visually accompanied by real-life para-ludic action like changing the stage lights, starting smoke from smoke machines, switching on wind machines. The main actor however is the Virtual DJ with his fabulous soundgun.

The software developed for "postvinyl" consists of two separate software environments communicating with each other via a TCP/IP interface. The Unreal game engine has been significantly extended by a set of new classes written in UnrealScript. These classes contain code for a new trigger actor which sends TCP/IP messages to an external client on the condition of being triggered in the computer game by an avatar or any other pawn. The messages sent contain information about the time the trigger was touched and the tye of the trigger event. Such event types can be "green room lights on", "start smoke machine", "wind machine 1 off" or the like. It is possible to run the TCP/IP client on the same machine Unreal is executed at, or on a second computer connected to the first computer via an Ethernet LAN. The TCP/ IP client is a simple application written in Visual BASIC reading incoming TCP/IP data and converting it into MIDI data which is then output to any MIDI compatible external device. In our tests we used an AKAI sampler AKAI S01 and a set of coloured lights controlled by a M2L Pro light controller. For future performances we intend to make use of a recently programmed add-on enabling us to control stage lights and a fog machine.

Online Documentation:

Webpage: http://creativegames.org.uk/art/postvinyl/

Streaming video can be found at http://creativegames.org.uk/art/streaming_media/ for streaming video (Java run time engine reqired)

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«Architekturen des Augenblicks» – a phenomenological outline of the medialization of urban space in the 20th century

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I will explicitly talk as an art and architecture historian and i will try to open up the historical prospective on a phenomenon which has yet a more than 100 years old history and is strongly connected to the histoty of industrialization, electrification and the modern developments in architecture and urbanism in the 20th. Century.

New media and information technologies in the urban space have taken on many shapes – exhibition and conference demonstrate this impressively.

In actual fact, we are being confronted with a comprehensive scenario of medialized and information-technologized architectural and spatial concepts. They find their most invisible expression in increasingly omnipresent surveillance …

• Abb. 2: Überwachungskameras

… and their most visible embodiment in more or less spectacular media facades.

• Abb. 4: Medienfassaden Paris, Frankfurt, Berlin, Seoul

In a popular definition, a media façade represents a projection screen, surface or "skin" for pictures, light, sound and color, increasingly attracting commercial interests coupled with artistic ambitions and, in the truest sense of the word, setting the stage for technological innovations and experiments. By contrast, beyond the medialization of urban space characterized by commercial and possibly political interests, an euphemistic vision of a "new infrastructure" for a young and unconventional cultural scene is evolving along the lines of interaction, participation, new forms of networking, etc.

In accordance with a definition by the well-known Berlin-based media architect and media artist Joachim Sauter (1), media facades represent a "fourth format" that has to conform to two criteria: "On the one hand" according to Sauter, "a media façade should form an integral part of the architecture. It should be the skin and not a mask, make-up or scar on an architectural body. On the other hand, in its expression and narration it must correspond to its function and the architectural design. And: it should not be assigned a theatrical role that contradicts the content of the building."

With this postulate from the year 2004, Sauter does not only formulate a functional claim in the sense of "form follows function" of the classical modernity. He obviously also lays a sort of moralistic claim to the honesty and authenticity of a medial intervention that in a somewhat odd way is attached to the pejorative use of the adjective "theatrical". Nevertheless, his demand for truth and truthfulness aims directly at the discourse surrounding the increasingly medialized space that has become evident over the course of a century as a result of the advent of electricity. This urban space, which dates back to the classic modernity of the 1920s, has not only become the scene of conflict between thoughtless commercialization and demanding design, but it has also become the embodiment of a place that in large format represents what has become the verdict of the age of information and media: simulation.

• Abb. 5: Nacht Licht Stadt

Therefore, it will be not only necessary to thematicize the medial figurations of architectural and urban space caught in the crossfire between media-technological innovation and the development of materials and technology. It will also be necessary to contextualize these concepts in a history of the iconography of medialization in architecture. And it will be necessary to sound out their effects on the spatial configurations of urban architecture, and to put up for discussion their concept of public and civic space – how it was mentioned in some of the contributions we have heard.

Today, in the context of this panel, I can do this only sketchily and allusively. Therefore I would like to highlight some crucial examples and essential aspects which mark and illuminate the history of the perception of urban space and its medialization since the twenties of the last century.

• Abb. 6: Zitat Lichtenberg

At the end of the year 1774, the german experimental physi-cist and author Georg Christoph Lichtenberg (1742-1799), who was a professor at Göttingen University, started on his second journey to England.

In one of his numerous letters, Lichtenberg describes the regular evening whirl on a London street which, in his own words, is only a fleeting portrayal. To me, however, his account of the plethora ("plessora") of sensual impressions represents no less than the description of a painted picture: it is full of lofty shimmering and glitter, mirroring and glistening, and we can only suspect the "sensual orgy" which left not only Lichtenberg dazed - but also his readers!

The motifs that Lichtenberg chose to show us "the impertinence and scandals of the perception of the big city" – as formulated by the german literary scientist Heinz Brüggemann – are of visual forcefulness and intensity and they have therefore found a firm place in the literary topology of the experiences of a modern big city.

Light, color, mirroring, the kaleidoscopic spinning of pictures and signs and the convergence and no-longer-being-able-to-separate all of the sensual impressions: all of that remains valid today in the cognitive reading of the medialized urban space and represents the ingredient motifs for its design.

Walter Benjamin wrote of the "interconnection of space" , der «Verschränkung der Räume» when in the 1930s he considered the "mirror city" of Paris to be the metropolis par excellence of the 19th century in his great «Passagenwerk».

And in the literary pieces published in the *Frankfurter Zeitung* in the 1920s, the german author Franz Hessel wrote a literary testimonial to the «architecture of the moment», den «Architekturen des Augenblicks», when advertising was implanted in the urban space and began to reconfigure and cover it with its own reality.

• Abb. 7: New York 1914 und 1937

While the architects and designers of modernity formulated the aesthetic principles of urban spaces that were being increasingly medialized and dynamized, artists, photographers and filmmakers were searching for adequate forms of expression with the new media and the connected new experiences of perception and space.

• Abb. 8: G. Kepes, Berlin 1930; E. Mendelsohn, New York, 1929

In this context, it would be photography, but particularly film that would open up new possibilities for simulating architecture, space, and urban experience.

• Abb. 9: Walter Ruttmann, Sinfonie der Großstadt, 1927

The potentials of film were recognized early on, and were investigated, in particular, by the artistic avant-gardes of the 1920s, for example in the works of László Moholy-Nagy, as well as in films such as Walter Ruttmann's *Berlin. Die Sinfonie der Grossstadt* (Berlin, Symphony of a Metropolis) from 1927 and

• Abb. 10:

Dziga Vertov's *The Man with the Movie Camera* from 1929.[1]

New analytical potencies arose from the possibilities of cinematographic simulation. Film became a medium of dynamized urban experience: A new image of the city emerged within its dynamic visualization by the means of the camera-eye.

1

• Abb. 12: Laszlo Moholy-Nagy, 1929

Two perceptual events and spatial experiences were of central importance

in this context: the visualization of movement as a mode for representing time, and the transformation and dematerialization of the nocturnal urban environment via the diverse manifestations of light – means moving light: the invention of the metropolis in the orchestration of advertising, light, and movement.

And even if a mobile, motorized experience of the urban realm still remained a privilege of the few, particularly in respect of the visual stimuli available from a moving auto-mobile, such experiences would become a decisive source of inspiration that affected both: urban planning concepts and the design of individual structures.

And when in the wake of World War II individual mobility became a mass phenomenon, the automobile became now a planning parameter, while emerging from a new aesthetic – one founded on perceptual psychology – as an instrument of city and planning analysis that found its adequate forms of expression in film, and in cinematic resources generally.

• Abb. 13: Learning from Las Vegas

This was the basis for architects such as Robert Venturi and Denise Scott Brown when they investigated Las Vegas around 1970. Even the american urbanist Kevin Lynch - who at this time was programmatically

preoccupied with ideas related to *The Image of the City* – had entiteled an essay written in 1964: *The View from the Road*[2].

And in her text "Learning from Pop," which appeared in *Casabella* in 1971, Denise Scott Brown propagated video and film as investigative instruments in urbanistic analytical and planning processes:

• Abb. 14: Zitat Denise Scott Brown

Architectural concepts that thematize these simulated urban and spatial

experiences in various ways emerge from this dialogue with filmic modes of perception – all the way to the design concepts of Bernard Tschumi

• Abb. 15: Bernard Tschumi, Manhattan Transcripts, 1977

and his *Manhattan Transcripts,*[3] from 1981/82.

• Abb. 16: Learning from Las Vegas

In the mobile, filmic urban analyses undertaken since the late 1960s, Scott Brown and Venturi discovered "main street" as an urban space that has become alienated in its mediatized symbolicity, and in order to develop from it a new, independent symbolicity for architecture.

Via ‹estrangement›, Pop Art contributed essentially to rendering visible the experience of ‹alienation› in a commercialized world.

• Abb. 17: Archigram, Instant City

Mediatized scenarios based on technological visions of the future are ironically ruptured again and again in the pointed urban Pop Art tableaux of groups such as Archigram.

2
3

With Pop, Modernism's claim of bringing ‹art into life› was in some sense

turned into its opposite: now, life pushed its way into art. But this was a ‹life› that at this point had already been diagnosed and identified as a mediated one. And mediatization – which for the avant-gardes of the 1920s was still capable of founding a new claim for art – had in the meantime become the object of a critique of civilization, or at least of a discourse that was skeptical of the media.

In light of the *Society of the Spectacle*[4] on which Guy Debord trained his

sights in a highly critical fashion in 1967, perhaps nothing could have been more misleading than to have taken Las Vegas seriously in urban planning terms, let alone proclaiming it a new model.[5] - For here was the quintessential experience of being totally overwhelmed and alienated by an environment dominated and guided exclusively by commercial interests and mediatized artificiality - in short: total simulation.

All the more illuminating, then, to remind ourselves that Lewis Mumford,

the American architecture critic and historian of the city, must have been aware of the phenomenon of simulation – without ever referring to it explicitly – when in the last chapter of his profound 1961 historical study of urbanism *The City in History* under the heading "The Shadows of Success," he focuses his pitiless gaze on the contemporary "metropolitan denizen":

• Abb. 18: Zitat Mumford

"He (this "metropolitan denizen") lives, not in the real world, but in a shadow world projected around him at every moment by means of paper and celluloid and adroitly manipulated lights: a world in which he is insulated by glass, cellophane, pliofilm from the mortification of living. In short, a world of professional illusionists and their credulous victims. […] That life is an occasion for living and not a pretext … [does] not occur to the metropolitan mind. For [him], the show is the reality, and the show must go on!"[6] Mumford conjures up an image of the metropolis as a form of fundamental cultural (self-)deception, one that has degenerated into a world of mere appearances consisting of distracting maneuvers and substitute worlds.

In those descriptions of this civilizational condition into which the metropolis has deteriorated in the modernity of the 20th century, Plato's metaphor of the cave has experienced a contemporary renaissance, in agreement not least with the german philosopher Hans Blumenberg, who interprets "the metropolis as a repetition by means of new media and technology of the pre-civilizational cave […]."[7]

• Abb. 19: Toyo Ito, Vision of Japan, 1991

In this context, Japanese architect Toyo Ito has provided us with an exceptionally vivid translation of this metaphor into a mediatized

spatial environment. In his design of the exhibition scenario for "Vision of

Japan," held in London in 1991, it was perhaps less a question of any visualization of a "simulated dream of the future world," as the architect himself imagined.[8]

In the “interlocking of (simulated) spaces”[9] staged by Ito, he displayed instead a simulation of that very simulation into which the frequently invoked metropolis – the one dematerialized by information flows and by its own “simulating” visualizations – had ultimately degenerated.

Platonic Caves

Plato’s metaphor of the cave is one of the founding metaphors of European thought, as well as of the discourse of simulation in Modernity. With the mediatization of space, which took place in the 20th century on the basis of electrification, and the visualization technologies and strategies emerging from it, the Platonic cave underwent a new and thoroughly vivid interpretation.

At the same time, this experience of mediatized space was described early

on as an experience of dematerialization and virtualization, for example by the German architect Hugo Häring in 1928:

• Abb. 21: Zitat Häring, englisch

(“The square as a space in the sense of the historical art of urban planning no longer exists, it has been destroyed, completely dissolved.

In the afterimage, nothing corporeal exists any longer […] the light sources appear freely disposed in space, floating. […] Found everywhere, then, is the complete opposite of the historical architectural square. In terms of building material as well: light instead of stone. the conquering of open space […].»)

The city – which had been dematerialized, “virtualized,” and transformed

by light and the newmedia into a large-scale media space – preoccupied the designers and artists of classical Modernism.

The ingredients of the artificial night transformed urban space into a magical realm of illusion. This was founded on technical developments that, while not yet functioning on the basis of (electronic) media, exploited first materials such as glass and its reflective effects; and with mirrors as such, which already constituted the experience of the virtual[10]: the countless reflections of the urban realm within whose “spatial interlockings” emerged an autonomous and artificial world of illusion, a new world of perception.

In this way, the idea and concept of simulation acquired its modern contours against the background of industrialization and electrification. And it acquired a new, multifaceted significance via the relationship of tension between a perceptual-psychological anamnesis of a technically accelerated world and its artistic visualization.

• Abb. 22. Leuchtspuren: «traces of light» - generated by the changings of light at Toyo Itos – unfortunately deconstructed «Tower of the winds» in Yokohama.

And it is still the night which is fascinating and crucial for the experience of mediatized urban space – think of last night.

But on the other hand mediated and mediatized space is a daylighted space of everydays experience, disvovered and promoted as a space of a new – renewed – experience of the public. And so the question which remains is: whether in order to this a new quality of simulation is arising: the simulation of the public!

A-Life: the creation and development of new modes of realism

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ABSTRACT This paper considers art and Artificial Life vis-à-vis the development and creation of new modes of realism. A brief sketch of the current conditions that underpin much in Artificial Life provides an alternative framework in which to consider Artificial Life screen-based artworks. Employing a ëmedia ecologicalí approach, the research explores the relationship between Artificial Life screen-based art and the broader digitally mediated landscape for the purpose of developing alternative modes of realism. These ideas are explored in the artwork Laboratories of thought and experimentations for future forms of subjectivation. Examining the representational codes and conventions associated with perspective and threedimensional digital space the artwork provides a foundation and lens through which to further explore representational codes and conventions in Artificial Life.

KEYWORDS Artificial Life, media art, realism, media ecology

INTRODUCTION

The natural world and all forms of human activity have been systematically and creatively modeled in conceptual form since antiquity. A short and by no means exhaustive list of authors investigating conceptual modeling, mainly within the arts, include (Alpers 1983; Mayr 1986; Deleuze, Guattari and Massumi 1987; Crary 1992; Elkins 1994; Foucault 1994; Virilio 1994; Holland 1998; Kittler 1999; Golley and Keller 2000; Yates 2000; Fuller 2005; De Landa 2006). These authors trace out complex arrays of composite schemas through which to understand the conceptual models of the world. These schemas of perception invite various readings of the models.

One reasonably nascent field to systematically develop models of the natural world and the human endeavor is artificial life (A-Life).1 Informed by principles advanced in ecological sciences and cybernetics, scientists in the field attempt to computationally model the natural world, biological systems, ecosystems and attempt to not simply synthesize ìlife as we know itî but moreover to ìcreate life as it could beî (Langton 1989). A-Life describes a specific area of research investigating the principles that constitute a living system ìwithout making reference to the materials that constitute itî (Adami 1998) as well as the ìstudy of the general properties of "cognitive and intelligent abilities"î (Risan 1997). For many researchers the capacity for the computational system to ìevolveî is paramount to A-Life; this view is best summed up by A-Life researcher Thomas Ray who states ìI would consider a system to be living if it is self-replicating, and capable of open-ended evolutionî (Ray 1991). It has also been observed that the present challenges of A-Life include ìthe transition to life, the evolutionary potential of life, and the relation between life and mind and cultureî (Bedau, McCaskill, Packard et al. 2000).

Of interest to this paper is the permeation of A-Life, including the scientific theoretical models of the world and the associated biological metaphorical representations that describe A-Life, into the broader cultural domain, in particular the arts. In How we became post-human (1999) N. Katherine Hayles proposes that A-Life (as an epistemological enterprise) is instrumental in creating the necessary conditions for our western modern society to develop into a post-human one (Hayles 1999). Hayles contends that narratives about and within the domain of artificial life ìconstitute a multilayered system of metaphoric and material relays through which ìlife,î ìnature,î and the ìhumanî are being redefinedî (Hayles 1999) furthermore ìIn the AL paradigm, the machine becomes the model for understanding the humanî (Hayles 1999). Critical to Hayles discussion are the creative capacities2 required to engage and interact with A-Life including the associated metaphors, models and techniques. Computer scientists, engineers and physicists working in the field of A-Life often develop these capacities and the associated biological metaphors to describe A-Life processes and techniques; that is the metaphors and strategies used to express A-Life are filtered through the domain of science (Helmreich 1998; Hayles 1999; Kay 2000; Barker 2006; Barker 2007; Johnston 2008).3

To fully appreciate the significance of this cultural shift we can examine other ënaturalizedí technologies

and associated capacities that radically reshaped western civilization. Whilst there is no scope to provide a detailed examination in this paper, a brief example will serve the purpose. In discussing the history of writing German philosopher Friedrich Kittler reminds us ìwriting functioned as a universal medium ñ in times when there was no concept of medium. Whatever else was going on dropped through the filter of letters or ideogramsî(Kittler 1999). Illustrating the point Kittler quotes from Goethe ìLiterature is a fragment of fragments; only the smallest proportion of what took place and what was said was written down while only the smallest proportion of what was written down has survivedî (Kittler 1999). Kittlerís argument is ìmedia ëdefine what really isí î (Kittler 1999). Such as it is, the following question is framed in relation to A-Life as a new mode of realism: what new ërealityí does A-Life, as a series of computational media competencies, define? Inversely we can also reframe Kittlerís remark into a contemporary one: whatever else is going on gets dropped through the filter of computational systems, cybernetic and ecosystemic processes and algorithms; and through the domain in which these processes and algorithms are predominantly formed, the sciences. 4 Hayles contends that the aforementioned metaphoric and material relays have a symbiotic relationship with and to the broader cultural domain; these relays feed into and are fed by the cultural imagination (Hayles 1999): none-so-more than artists investigating A-Life and the processes of computational evolution.

A-Life Art and modes of realism

Screen based A-Life artworks vary greatly in their enquiry (see Whitelaw 2004). However, the transmission of strategies from A-Life, as defined by normative scientific practices, into screen based A-Life artworks themselves is evident. A survey of A-Life screen based artworks created during the last 20 years underscores the success in which 19-20th century scientific strategies underpin, maintain and restrict alternative models of A-Life via the valorization of both 1.biological metaphors to describe ALife and 2. observation and the objectification of life (see Johnston 2008; Guglielmetti 2009). Hayles (1999) and Kay (2000) examine the development of the biological metaphor within science during the 20th century and chart in considerable detail the conflation of biological specificity into the domains of cybernetics, systems theory and information theory. As such, this paper will focus on the observational status of A-Life screen based art.

The scientific raison díetre (observation) in A-Life screen based art is de facto with few exceptions deviating from this norm. In other words, the observational model integrates as a standard protocol in A-Life and A-Life art.5 In summary, the computational processes used in a typical A-Life screen based artwork ìevolveî the ìgenotypeî (code) and ìphenotypeî (form) of the A-Life world. In general, these processes have not extended into ìevolvingî the view into the world. The window that frames the ALife artwork evokes the static nineteen-twentieth century ëscientificí study rather than suggestive of the media saturated twenty-first century landscape. To a large degree, this orthodoxy defines A-Life screen based art as it should be and not what A-Life is; a series of computational media processes.6

The observational model that frames the lens into the A-Life world is not so much problematic as it is incongruous with much in A-Life research as the entire parameter space of the A-Life world is up for grabs. That is, researchers in the field develop the capacities required to evolve the entire parameter space of the computational system, including the virtual camera into the A-Life world.7

What is striking is that limited research exists within the A-Life arts community that explores the ìopen windowî8 (the mathematical rationalization of pictorial space) or techniques used in cinema as potentially dynamic systems within two-dimensional or three-dimensional computational space. The lack of experimentation with the virtual camera in A-Life is significant given the dominance of montage, cinema, television and video (including their respective discourses) in the twentieth and early twenty-first centuries especially in terms of the suspension of disbelief, authorship and in relation to the formation of subjectivity and cultural identity.9

One approach in which to examine A-Life screen based artworks re-centers A-Life screen based art as constituent of a twenty-first century media saturated environment in which screen based culture transforms both the capacities for communicating and in the formation of subjective experience.

MEDIA ECOLOGY

Re-positioning A-Life art as constituent of a media saturated landscape is reminiscent of Matthew Fullerís ìmedia ecologyî (Fuller 2005).10 Media ecology according to Fuller is the relationship between information, materiality and the ìdynamic interrelation of processes and objects, beings and things, patterns and matterî (2005). In other words ì[a] media ecology is a cascade of parasitesî (2005). Fuller argues that media innovation surfaces when the collision of two or more standard yet disparate processes interact casting, as it does, the media system into cultural relief (2005). In light of this Fuller asks ì[w]hat arises when two or more standard processes, with their own regimes, codes, modes of use and deportment, systems of transduction, and so on, become conjoined?î (2005). Drawing on Deleuze and Guattariís ëmachinic phylumí, Fuller argues that all media and media systems are caught up in a complex socio-political, technical, material web. These elements, when they come together create something greater than the individual sum of its parts. For example when discussing ëJungleí music and pirate radio: "Fuller states that pirate radio is not a whole system but an aggregate of illegal, unlicensed broadcast signals that are created by spectrum poachers on regulated bandwidths, where the airwaves carrying voices of dissent in society collide with agendas, media, laws, and marketing. Voices that walk the margins in pirate radio are expressing a will to power through technology." (Moberg 2006) The totality of these elements produce an underground mobile music scene, a scene not readily evident by simply listing the elements, a scene that reproduces itself with every attempt to close it down or regulate it.

If we consider Fullerís observation regarding media ecology at face value a number of questions surface; what transpires by merging A-Life with other standard processes, codes of representation, ëpatterns and matterí external to a scientific discursive framework (for example cinema)? How might a social entity11 engage with, and in, such a system? These two questions attempt to re-center A-Life into a framework outside of its original ëuser specificí domain, one that reflects on A-Life as a constituent of a ìmedia formî (Manovich 2001). Reconceptualising A-Life as a media form provides the opportunity to divest it of the discursive framework and rhetorical strategies of the sciences by investing it with strategies from a broader media landscape.

As discussed, the lynch pin in an A-Life/cinema media ecological ëmashupí is the virtual lens. To describe the potential outcome of this marriage is difficult but the following descriptions, with the obvious caveats, come to mind; ëevolvingí a movie and ëgrowingí a documentary. These phrases whilst evocative are both inadequate to describe the broad concept: to both recalibrate A-Life screen based art with a new visual grammar and to ìexpand the grammar of film itself [by] creating a new visual syntax, new ways of morphing from scene to scene [and for creating] new logics for transitions between shots [and] new visual/thematic analogiesî.12 The artwork Laboratories of thought and experimentation for future forms of subjectivation (2007) was created to test both the visual language such an mashup might render in addition to exploring the complete transfer of one naturalized technique, in this case perspective, into a computational media framework. Whilst the project does not investigate or utilize ALife processes per se, it explores the limitations and potential for exploring ëmedia ecologyí in computational image making, one useful in exploring the virtual lens and A-Life screen based artworks.

PERSPECTIVE: THE EVERYDAY STATUS QUO

Artwork Description

Laboratories of thought and experimentation for future forms of subjectivation is a site-specific digital installation exploring the subjective experience of the world by exploring one conventional model of the world, perspective (both the mapping of reality from ones ëpoint of viewí and as an image making technique) and computational data structure, to generate an alterative mode of realism.

A three-dimensional digital representation of an arts gallery, called the Trocadero Artspace, was created in 3D software. A photographic survey of the site was undertaken and the digitized images were mapped to the three-dimensional model of the Artspace. The three-dimensional model was exported into a 3D games engine for users to navigate through. At a basic level the experience is similar to a playing 3D computer game, for example; the user employs a mouse or keyboard to navigate the userís point of view through

the three-dimensional model; and the three-dimensional architectural attributes are mapped to real world physics, such as gravity, walls are ësolidí, open doorways can be walked through etc.

The artwork, however, exploits formal techniques used in three-dimensional computer graphics to reorganise the conventional rendering of the three-dimensional model. The project ëmassagesí the computational data structure to reorder the visual field via a real, rather than virtual, point of view. Elements in the three-dimensional model are numerically ranked according to their emotional relevance to the artist and important elements are rendered in front of less important ones. The artistís favoured spot, his partnerís studio, is potentially visible from anywhere in the scene . While the spatial integrity of the Trocadero Artspace is maintained for the purpose of user navigation, the subjective re-rendering of the scene disrupts its representation of space, creating an abstract, navigable three-dimensional collage (Whitelaw, Guglielmetti and Innocent 2009).13

Brief technical overview

A 3D games engine is used in the project because it is designed to mathematically render perspectival space accurately. The three-dimensional modelís axis of depth, called the z-buffer, is used to reorganise the drawing logic of the scene. The z-buffer determines which elements are visible to the virtual camera, and which elements occlude other elements; in other words the z-buffer is a data structure that establishes the logical order in which elements are to be drawn in a scene (generally speaking the foreground is normally drawn in front of the background). The stacking order, or placement within the z-buffer, is determined by the scene's geometry: elements far from the camera are drawn earlier, and are occluded by nearer elements, drawn later in the sequence. The z-buffer is linked to the virtual camera. This connection between elements in the formal ontology of 3D graphics affords a familiar, ërealisticí, depiction of virtual space (Figure 2). Unpinned from conventional geometric formation the z-buffer is reconfigured along subjective lines. This reveals the z-buffer as a data structure - part of a computational ontology - rather than some ënaturalizedí spatial order (Whitelaw, Guglielmetti et al. 2009). The project explores the ìtensions inherent in the rationalization of pictorial space as a model through which to filter subjectively mediated perceptual experience of the physical environmentî (Guglielmetti 2009) or put simply as a ìnew means to understand the worldî (Kluszczynski 2003).14

CONCLUSION Perspectival formalism is specifically examined in Laboratories of thoughtÖ because perspective as a technique or ìsystemî codifies the visual field by foregrounding the connection ìbetween representational systems and the technologies that are used to generate these systemsî15 (Hoy 2005). The project examines the ways in which perspective as a ìrepresentational ëcodeí or algorithm has come to shape what we see as ërealisticí or ëtrue to lifeîî (Hoy 2005). In Laboratories of thoughtÖ the techniques used to render a dominant model of subjectivity (first person perspective) are remapped to a model in which the objects and elements in the world are numerically graded then rendered according to subjective emotional criteria (Whitelaw, Guglielmetti et al. 2009).

According to James Elkins, perspective, both as a series of creative experiments and as a conceptual model that gives rise to and shapes our point of view (Elkins 1994)16, has a complex genealogy culminating in the creation of modern perspective as an artifact of the Enlightenment (Elkins 1994).17 Similarly, whilst scientist Colin Martindale clearly demonstrates observation is sciences raison d'être (Martindale 1990), Crary reminds us the formation of modern observation developed from various historical processes and cultural activities (Crary 1992).18 Assuming Elkins and Crary are both correct in that point of view and observation (respectively) are both modern artifices that shape our knowledge of the world, A-Life, as a series of processes and competencies, is an artifice that shapes our knowledge and experience of the post-human environment.

In mapping the historical trajectories of ëvisioní French philosopher Paul Virilio identifies ëartificial visioní, that is the ìautomation of perceptionî via computational processes (Virilio 1989; Virilio 1994), as a new challenge for contemporary society.19 Anticipating A-Life and motivated by developments in neural networks, specifically the perceptron model20, Virilio states: Once we are definitively removed from the realm of direct or indirect observation of synthetic images created by the machine for the machine

instrumental virtual images will be for us the equivalent of what a foreignerís mental pictures already represent: an enigma (Virilio 1994). The potential significance of Virilioís enigma and the broader question of A-Life as ìlife as it could beî are refined in (Johnston 2008). Johnston proposes that ìthe question, what is life? is perhaps more central to ALife than it is to biologyÖ ALife gives itself a double objective: to advance scientific understanding of the mechanisms and logic of life regardless of medium and to bring into existence new forms of nonorganic lifeî. If A-Life is a form of nonorganic life, these ëlife formsí require an entire array of creative capacities to communicate with humans (more so if this communication becomes an everyday experience). The dominance of the ëmoving imageí within western culture during the past century, including the capacities required to decode the moving image, has been instrumental in the formation of modern and post-human subjectivity. The challenges for researchers in the field of A-Life include adopting a range of strategies foreign to A-Life without jettisoning the principles that underpin it. In employing techniques such as montage the challenge is not to simply synthesize ëcinema as we know itís but to create ëartificial vision as it could beí; to evolve the virtual camera from an artificial ëlife formsí point of view.

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NOTES

1 The term ìartificial lifeî was coined by Chris Langton in 1986 (Langton 1986). 2 A capacity is characterized by what a social entity is ìcapable of doing when they interact with other social entities.î (De Landa 2006) 3 I am reminded of an essay by Hakim Bey in which he muses on the missives on the back cover of the zine ìNOî part of which exclaim ìWHOEVER CONTROLS THE METAPHOR GOVERNS THE MINDî (Bey 1998). 4 This requires further unpacking; Helmreich argues that a range of subjectively experienced (privileged) activities make it possible for scientists to undertake their research. These activities include access to adequate healthcare, economic stability, education, social status etc to, with and from within an institutionalized framework that informs both the capacity to undertake objective analysis in addition to the way scientists view the subject matter they seek to objectify (Helmreich 1998). 5 I donít want to appear disingenuous here; most artists working in the field have other research interests and simply might not be interested in the correlation between cinema and A-Life. There are notable exceptions for example research at MITís ëInteractive Cinemaí is related however the key themes of the MIT research investigate the sampling of information from the outside world via video, gestural controllers and microphones for improvised real-time performance (Nemirovsky and Watson 2003) (Nemirovsky 2003) and as a story generating system (Davenport, Barry, Kelliher et al. 2004). I am interested in evolving the virtual lens from an artificial lifeís ëpoint of viewí not as a planning tool. 6 DeLanda makes a similar observation regarding ëartificial intelligenceí and its relationship to ìolder paradigms of what a symbol-manipulating ìmindî should beî (DeLanda 1998). 7 This incongruity is perhaps not surprising given that the conceptual insights and conceptual limitations within A-Life research filter through the lens of the ëhard sciencesí; evolving the virtual camera would disrupt the observational nature of the work. 8 In making reference to Albertiís formalization of perspective in Della Pittura (1435) I seek to make the connection between one ìnew realismî (White 1972) with a new contemporary realism. 9 Given the clear relationship between A-Life visualisation, screen based culture and the moving image it is ironic that the ëtraditionalí arts are often evoked in A-Life art, including drawing, painting, music and sculpture, yet montage (cinema and video) is excluded from most A-Life screen based art works. 10 A-Life already employs a media ecological approach; a collision between computation, biology and animation. My approach extends the ecological framework to include a diverse range of institutionalized socio-political activities. 11 The term social entity is used to describe a participant or ëuserí involved in such an activity. 12 In private correspondence with visual media theorist Drew Perry. 13 Usability studies have not been conducted on the project. 14 The project has resonance with other artworks for example see the works by Tamás Waliczky. 15 For an introduction into perspective in art see (White 1972; Gombrich 1982; Panofsky 1991; Crary 1992; Elkins 1994; Elkins 1996; Crary 1999; Gombrich 2002). 16 I draw on (Foucault 1991; Crary 1992; Elkins 1994; Foucault 1994) for a description of perspective as a cultural invention, albeit I am persuaded by Pinkerís

argument regarding the role of cognitive function in the formation of ënaturalí vision (Pinker 1997). 17 As in most creative endeavors modern perspective was not predetermined from its inception in the early renaissance. The developmental process of perspective has much in common with Csikszentmihalyiís ìvariation, selection and transmissionî process (Csikszentmihalyi 1999). 18 This is a view supported by Helmreichís anthropological study of A-Life researches in the Sante Fe Institute one of the key institutes researching A-Life in the US. (Helmreich 1998) 19 Machine ëvisioní is a concern also raised by Guattari who is ìconvinced that the question of subjective enunciation will pose itself ever more forcefully as machines producing signs, images, syntax and artificial intelligence continue to develop.î (Guattari 2000) 20 Frank Rosenblatt developed the perceptron in 1957. For a reasonably accessible description of the model see (Davalo and Naim 1991).

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The Sonic Commons

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ITEM_01 PAPER ABSTRACT: -
The Sonic Commons (and the privatisation of the aural vis-à-vis).

Synopsis ~ The Sonic Commons is an examination of the formation of the contemporary urban soundscape, or the Sonic Commons and the social, economic and technological pressures that are transforming our shared aural spaces. The paper will focus upon the historical development of forms of public address in urban space and will follow the tendencies that are currently privatising our aural experience. The paper concludes with a discussion of location sensitive, mobile audio technology, which offers the potential to facilitate communal aural realms.

Introduction ~ Contemporary western culture takes such notions as the private and the intimate very seriously, regarding them as both fundamental and natural rights. So closely linked are they to the basis of industrial capital that it is easy to overlook the historical reality, where private space, as opposed to the public vis-à-vis is a relatively recent luxury commodity!

In the audio realm, the communication technologies of the telephone and wireless broadcast have created and proliferated the possibility of intimate listening spaces within the public domain. Recent developments in mobile audio devices such as the cell phone and personal listening systems have amplified the transformation of the sonic commons, punctuating it with myriad imploded private soundscapes.

Such immersion in the self, in such selective listening, is a retreat from public and shared aural forms towards an individualised and commodified form of aural experience. This movement strongly parallels with the recent embrace of political and economic tendencies that shun the collective and communal but which valorise the individual and the privatised.

This paper analyses the composition of contemporary aural environments proposing them as heavily contested communication spaces and attempts to parallel the mounting pressures of the urban context with the increasing acoustic stress found within so called natural environments.

The paper concludes by proposing concepts of Re-Situation and Re-Immersion. Other recent technologies are however starting to reverse these paradigms of isolation and withdrawal from social and geo-spatial situations. Locative forms of media are beginning to situate the participant in a geographic and cultural context at both the theoretical and experiential level that potentially might reinstate an electronically mediated vis-à-vis.

PAPER: -
This presentation is an extract from a longer essay The Nomadic Ear is available at at: -
http://www.sonicobjects.com/index.php/sonicobjects/more/the_nomadic_ear

A reprise: -
To furnish a context, the original essay examined concepts of spatiality, of location and the interactions of sounding bodies that articulate and activate the soundscape. How we as auditors experience the sonic domain and how we as authors compose and construct compelling, immersive audioscapes.
As a means of illustrating some strategies and methodologies for the design and composition of sonic narratives (soundtexts) in non-linear audio environments, I shall use four characteristic modes from my own creative and research projects that exhibit various forms of Immersion to highlight these issues.

1. Three-dimensional speaker arrays with dynamic spatial audio.

2. Environmental and public soundart projects.

3. Interactive multi-channel projects.

4. Location sensitive terrain-based spatial audio research.

These four categories of soundart projects each deal in a different manner with modes of immersion and with different constructions of narrative and forms of interaction. Each category adopting different strategies for composition and content development within immersive environments; identifying varied auditor experience, highlighting concepts of Linearity and Non-linearity and changing perceptions of locale and locatedness.

The works also allude to the changing concepts of sonic immersion particularly in reference to Public Space by indicating how the technologies of audio transmission and reproduction have increasingly enabled and encouraged forms of privatized and selective hearing affecting a withdrawal from the Sonic Commons.

Before we launch into the main topic let us, begin with the simple question of our location. How might our auditor position themselves in the vast and complex web of vibrations that form the sonic environment? The answer is both simple and fundamental ~ our sensorium demands that each, and every one of us inhabits the epicentre of the sonic world; we permanently occupy a mobile sweetspot (to employ the parlance of the audiophile). There is of course no better place to be ~ whilst we share equally in the sonic commons we are simultaneously privileged as the absolute ruler of our personal sonic realm.

In effect, our senses form a Procrustes Bed upon which the palpable world must comply. Therefore, that which we naturally assume to be comprehensive and exhaustive is simply a small portion of a vast spectrum that extends well beyond our perceptual hearth and home.

The second alarmingly simple issue is that of Immersion. Whilst achieving a convincing sense of immersion in the form of an artifact demands considerable skill (and generally piles of expensive equipment) it is ironically an inescapable condition of our quotidian experience. We are immersed in the womb, bathed by pulsing body fluids and maternal speech alike; upon issue into the world we are henceforth saturated in subtle vibrations and alarming noises whether awake and asleep, like it or not! Immersion and Centrality are therefore naturalised conditions of our acoustic experience.

So to the Sonic Commons!

Privatisation.
Contemporary western culture takes such notions as the private and the intimate very seriously, regarding them as both fundamental and natural rights. So closely linked are they to the basis of industrial capital that it is easy to overlook the historical reality, where private space, as opposed to the public vis-à-vis is a relatively recent luxury commodity!
In the audio realm, the communication technologies of the telephone and wireless broadcast have created and proliferated the possibility of intimate listening spaces within the public domain. Recent developments in mobile audio devices such as the cell phone and personal listening systems have amplified the transformation of the sonic commons, punctuating it with myriad imploded private soundscapes.

Such immersion in the self, in such selective listening, is a retreat from public and shared aural forms towards an individualised and commodified form of aural experience. This movement strongly parallels with the recent embrace of political and economic tendencies that shun the collective and communal but which valorise the individual and the privatised.

The concept of aural privacy, once inextricably linked with either spatial isolation (a conversation in camera) or with furtive behaviour (whispering) now strikes us as remarkable. The internalisation of sonic narratives has an interesting precedent in the discovery of silent reading; for we forget that before the 5th century the literate were also performers of written texts. The first known citation of silent reading being recorded by St Augustine in reference to a 5th century monk Ambrose.

When he read his eyes scanned the page and his heart sought out the meaning, but his voice was silent and his tongue was still. Anyone could approach him freely and guests were not commonly announced, so that often, when we came to visit him, we found him reading like this in silence, for he never read aloud" 1

To gauge the significance of this shift in behaviour imagine a London Tube at peak hour with the entire carriage intoning articles from the Times and the Telegraph!

Telephony; locatedness and public speech.
Whilst it is common knowledge that technological forms of sound reproduction have had a dramatic effect on the manner in which we experience sound in the public realm, we are less aware of the underlying transformations in relation to the spatial location, temporal displacement and the virtual elimination of provenance that mark recorded and transmitted audio.

Murray Schaefer 2 coined the term Schitzophonic to denote the splitting of a sound from its original source, en-route to being embalmed in a recorded or transmitted medium. Schitzophonia is at the very heart of both the temporal and spatial dislocations with which we are now so familiar. Schitzophonic audio therefore runs counter to the powerful and fundamental psychoacoustic linkages between the eye and the ear, primal linkages that form the perceptual glue allowing us to instantly identify a sound with its source and location. This disassociation of sound and source is enshrined in the history of Electroacoustic music as Acousmatiques. 3

The original fixed landline (point to point) telephone represents one of the earliest experiences of schitzophonic audio. Even so, the early telephone system clearly marked the geo-spatial location of those in dialogue to the point that each correspondent associated the signal with both a personality and a physical surrounding and therefore to some extent, the telephonic act became a sonic bridge between familiar sites. At each end of the line, an imagination of the distant site, a parlour with overstuffed chairs and a mothers dress, a formal wood paneled office and the smell of pipe tobacco and so on.

Thus, the landline partially diminished the spatial otherness implied by communication at a distance by frequently reinstating a supplementary knowledge of the distant location. Contemporary telephonic communication has however become increasingly de-territorialised and de-racinated, in effect promoting dialogue between nomads, obliterating the concept of familiar location or environs. It is not without irony that the first question posed during a mobile phone conversation is not ~ How are you? but ~ Where are you? ~ with the inevitable response ~ I'm on a bus!

Along with mobility the cell phone has initiated forms of social evolution (or devolution). Originally phones were mounted on walls their earpieces at head height ~ it was of course impolite to talk to a stranger in a sitting position, it was also considered improper to chat on a telephone (something apparently women were inclined to do). Early telephone companies went to considerable lengths to reserve the device as a business machine and in some cases strove to keep them out of private homes! Nineteenth Century telephone aficionados would be alarmed at the prosthetic application of Bluetooth headsets and the spectre of the glossaliaic pedestrian merrily talking to invisible correspondents and gesticulating wildly ~ mannerisms formerly associated with the asylum.

Wirelessness, smallness and mobility ~ the Tranny and the Boom-Box.
The development of transistors delivered miniaturisation and ipso facto true portability, the consequence being that radio and phonographic replay now could leave the home (and the power outlet) to head for the

streets, the beach and the ghetto. This Sonic-Assault has two phases; the Intrusive and the Implosive.

The first of these audio modalities, the invasive or expressive is exemplified by the Ghetto-Blaster and its more recent incarnation, mega-bass low-rider vehicular sound systems. Whilst the old boy with the transistor glued to one ear, listening to the cricket (or the ball-game) is not considered as noise pollution ~ the dude with the Boom-Box is trying really hard! The Ghetto-Blaster in effect re-ritualises sound in public space and makes an unequivocal claim on cultural space.

In marked contrast to the expressive nature of the Ghetto-Blaster, we are currently witnessing an implosion of Audio-Worlds (as if in recoil from an overload of Urban stress) into the micro-acoustic-ecologies of the Walkman, the cell phone and the iPod.

This tendency initiated by the Walkman and now conferred upon the iPod, nullifies the vis-à-vis of Public Space, transforming collective experience into serial withdrawal ~ A retreat, perhaps a respite, from the press of bodies in the commuter train, an escape from the pressure of being a (social-being) within the anonymous Crowd. The general and desired use of mobile entertainment audio is to isolate the user from anonymous public situations (Crowd) and transitory geographical/spatial situations (Transit) with Public Transport being the ideal nexus. The audio-bubble effect also extends to the monotony of the gym treadmill, the boredom of air travel and ironically to the delights of jogging.

To be optimistic we might embrace the concept of a greater community of consumers, allowing ourselves to indulge in a simplistic embrace of the notion of a freedom of choice within the free-market economy of music(s). We might also adopt the view that all music is now world music, a commodity form set free from ethnic and cultural boundaries by the corporate sector.

In this scenario we can assert and affirm our individuality by the esoteric nature of our playlists, even sharing them, in a generous act that freely gives, that which is not legally ours (sorry Sony records but thank-you Limewire).

That which remains...
The counterpoint to an audio world composed of myriad private mobile soundscapes is found in it's negative envelope, that which remains as public aural space inhabited by those weak and fractured signals that escape from ear-buds and headphones. Unlike the hauntingly somatic riffs of a street saxophonist, playing to no one in particular, late at night these are transient B.P.M. signals just audible enough to attract the attention, but instantly discarded as irrelevant and redundant. The ear constantly hunting but failing to identify, meaningful patterns; a mechanism reminiscent of British Army Intelligence audio-torture, once practiced against IRA political prisoners until it was halted by the International Court!

Mobile telephony has offered captive-audience commuters the inescapable aural entertainment of eves-dropping to telephonic semi-dialogues, those either strident or intimate half-conversations (those not quite monologues) that drive the imagination of the curious listener to synthesise and embroider the narrative of the absent correspondent. The lack of inhibition that permits these private dramas to spill into public space could be seen to invert the notion of an imploded, privatised aural realm if it were not for the total disconnection that the protagonist effects when projecting themselves into the telephonic aether. It seems that correspondents are simply not in the same psychic space as fellow commuters and likewise assume that their monologues remain covert and cryptic.

And the Beasts of the Field…
The final note on audio stress in urban environments concerns not the Sardines packed into commuter trains but urban wildlife. Recent research 4 has demonstrated that birds are singing louder and at higher pitches in order to communicate over the raised noisefloor of the city soundscape. As urban noise pollution is biased towards lower frequency mechanical sounds (motors, air conditioners etc) birds are responding by shifting register above these frequencies. Urban areas also tend to be more spatially open when compared to dense

woodland settings, in which birds often favour lower pitched song to avoid signal reflection by foliage.

Even more alarming is the current legal battle concerning the US Military encroachment of the Deep Channel strata of the Oceans, using them for mid and low frequency active sonar detection, but with lethal consequences for Whales 5. The US court has recently upheld the Military's right to deploy such low frequency systems despite conclusive evidence that demonstrates the signals resonate the internal ear of Whales destroying their hearing and depriving them of their ability to navigate, resulting in many standings and deaths. Ironically it was military sonar operators who initially documented the singing of whales enabling the entire debate about their sentience ~ it is doubly ironic therefore that Japanese whaling ships are deploying a US Military technology, LRAD (Long Range Acoustic Devices) arrays as sonic weapons against the anti-whaling activists onboard the Sea Shepherd, causing nausea and hearing damage amongst the crew.

Re-Situation and Re-Immersion.
To return to the Sonic Commons ~ recent location sensitive technologies have the potential to reverse the paradigms of isolation and withdrawal from social and geo-spatial situations. Locative forms of media are beginning to situate the participant in a geographic and cultural context at both the theoretical and experiential level that potentially might reinstate an electronically mediated vis-à-vis.

The AudioNomad project may be simply defined as an augmented audio reality system 6 that adopts a naturalistic or landscape model of our sonic experiences, operating via a metaphor of sonic-cartography and able to co-locate virtual audio with physical features of the environment.

There is a marvelous passage in The Life and Opinions of Tristram Shandy 7 that describes a unique map made at one to one scale, that is a map made to fit exactly over the physical features it represents! The AudioNomad research programme operates a sonic cartography with very similar characteristics, due to the potentially vast scale of the geographic area available to the GPS enabled system and amplified by the fact that the sound composition is performed in real time by the mobile presence of the user traversing real geography.

Yet, another literary source provided the conceptual impetus for the development of a sonic cartography able to seed a physical environment with virtual audio memories. The storage and retrieval of audio content within a complex soundscape, virtually associated with real landscape objects, has its precedence in the classical mnemonic system for storing rhetoric. In The Art of Memory Frances Yates 8 paints a vivid picture of the antique technique that enabled Orators to place memory objects (such as lengthy quotations) within the labyrinthine spaces of classical architecture. By visualizing an architectural interior, real or imaginary, the speaker might place here a red cloak over a sculpture (as a mnemonic trigger) and there, a sword on a table to locate yet another passage. By memorizing a stroll through this virtual architecture, an Orator could retrieve a vast amount of correctly sequenced rhetoric.

The AudioNomad project transmutes such imaginary architectural space into the cartographic space of a digital map (itself a representation of the physical site of the project) and develops a complex sonic landscape by and assigning soundfiles, trajectories and other acoustic and navigational properties, at multiple locations within this virtual domain.

Whereas the classical rhetorician would re-play a walk through an imaginary architecture, to sequentially retrieve the elements of a speech, the participant in an AudioNomad project literally walks in a real environment, their position and orientation driving the software to render an immersive and dynamic soundscape via surround enabled headphones. The user perceives individual audio events to be located at specific points in physical space and as these share similar acoustic properties with the surrounding ambient sound a seamless nexus is formed between the real and the virtual suggesting a type of parallel audio world, in which memories of particular sites are invoked alongside contemporary reality.

Futures and Conclusion ~ Edison's Ars Memoria concept for the phonograph.

Your words are preserved in the tin foil and will come back upon the application of the instrument years after you are dead in exactly the same tone of voice you spoke in then…..This tongueless, toothless instrument, without larynx or pharynx, dumb, voiceless matter, nevertheless mimics your tones, speaks with your voice, speaks with your words, and centuries after you have crumbled into dust will repeat again and again, to a generation that could never know you, every idle thought, every fond fancy, every vain word that you chose to whisper against this thin iron diaphragm. 9

Edison conceived the phonograph plain and simple as a memorial device, a means to archive the transient voices of relatives as a sonic counterpoint to the family photo album. That the future of the phonograph was to rapidly evolve into a commercial device driven by musical entertainment is with hindsight an obvious irony, but one that Edison both missed and was resistant too. Naturally, we should not overlook the fact that Edison was partially deaf! 10

GIS worlds ~ the environment as a polyglot audio archive.
Notwithstanding the overwhelming use of audio recording technology harnessed to the commercial mill of the music industry, Edison's presentiment concerning the mnemonic use of audio has a ring of truth. The potential to develop intelligent, interactive audio-cartographies, as outlined in the AudioNomad project, in which powerful GIS technologies serve ubiquitous mobile devices may well see a world in which audio memories reside in every nook and cranny, attached to URL's domiciled at the nodes of a global 10cm grid.

In the vein of Pygmalion, the Edison Company turned its hand to manufacturing talking dolls, producing several thousand in the 1890's. This uncanny embodiment of the voice in the mechanical flesh of a puppet is today transformed into a range of (not so smart) mobile devices; but devices that will within a short period of time, become intelligent companions, potentially far more sensitive to physical location and the invisible flows of data than ourselves.

1 St. Augustine of Hippo a series of thirteen autobiographical texts by written between AD 397 and AD 398. Confessions.

2 Schafer, Raymond Murray 1977 The Tuning of the World. Random House Inc.. ISBN 0394409663.3 Acousmatics (from the Greek Akousma, what is heard) has its origins with Pythagoras (6th century BC) who delivered his oral teachings (oracle-like) from behind a curtain in order to prevent his physical presence distracting his students, a technique designed to grant them a pure focus on the content of his words.

3 In 1955 the term "Acousmatique" was employed by the poet Jérôme Peignot, at the beginning of musique concrète, as an adjective, meaning a sound that we can hear without knowing its cause, and to designate the distance that separates a sound from its origins, by obscuring, behind the impassivity of the loudspeaker, any visual elements that may be associated with it. Then in the early 1970s, Francois Bayle introduced the expression Acousmatic Music while director of the Groupe Recherches Musicales in Paris, employing it to denote a specific kind of music, as an art of projected sounds shot and developed in the studio, projected in halls, like cinema.

4 Hans Slabbekoorn and Ardie den Boer-Visser, at Leiden University in the Netherlands, recorded and compared great tits (Parus major) singing in 10 European cities and in nearby forests.

5 On March 15 and 16, 2000, nine Cuvier's beaked whales, three Blainville's beaked whales, two unidentified beaked whales, one spotted dolphin, and two Minke whales were reported stranded along the Northeast and Northwest Providence Channels on the Bahamian Islands. The strandings took place within 24 hours of the intensive use of active midrange sonar by U.S. Navy ships as they passed through the Northeast and Northwest Providence Channels.

Specimen samples were collected from four dead whales. Three of these whales showed signs of bleeding in the inner ears and one whale showed signs of bleeding around the brain. Whale biologists determined that the most likely cause of the bleeding was either a blow to the head or exceptionally loud noises.

"The investigation team concludes that tactical mid-range frequency sonars aboard U.S. Navy ships that were in use during the sonar exercise in question were the most plausible source of this acoustic or impulse trauma," the report concludes.
The interim report is available online at: http://www.nmfs.noaa.gov/prot_res/overview/Interim_Bahamas_Report.pdf

6 Augmented Audio Reality refers to a system in which allows an auditor to experience ambient/local sounds whilst simultaneously overlaying these with additional audio information. Virtual Audio Reality refers to a system that immerses an auditor in a dynamic and spatially active audio environment, which may or may not be linked to a corresponding visual domain (real or virtual). The audio supplied is intended as a total environment and supplants any local or ambient sound. VAR is not essentially concerned with a functional relationship to events and objects in physical reality, it is best employed in totally VR environments or where there is a desire to diminish or suppress the links between the visual and the aural in the quotidian world (as in the iPod). AAR on the other hand has a vital concern to link synthetic audio events and compositional; strategies with aspects of the physical environment through which the 'AudioNomad' is navigating (whilst simultaneously navigating the parallel cartographic/sonographic software).

7 Sterne Laurence 1759 to 1767 The Life and Opinions of Tristram Shandy, Gentleman London.

8 Yates Francis 1966 The Art of Memory University of Chicago Press.

9 Thomas Edison in a presentation to the New York Post.

10 As was his first wife Mary to whom he proposed by tapping on her wrist in Morse code; their first two children, were nicknamed "Dot" and "Dash".

The Art of being novel: rethinking cartographies of personalisation

Larissa Hjorth,

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ABSTRACT

In a global period whereby the "personal" is no longer associated with people but with affective technologies (Shirky 2008; Lasén 2004), the old feminist adage of the "personal as political" takes on new dimensions of meaning. Through the rise of social, networked media such as Web 2.0—characterised by Social Networking Systems (SNS like Facebook)—concurrent to the force of user created content (UCC), how we experience a sense of media, place, locality and globality is dramatically transforming. With the emergence of UCC "vernacular creativity" (Burgess) there is a need rethink intimacy, creativity, authorship and labour (social, creative, affective and emotional) in terms of how we imagine and practice art and new media. Drawing from my research into UCC in the Asia-Pacific, I will reconsider how emerging practices such as *keitai shōsetsu* (mobile phone novels) reflect, expand and remediate older media practices. In particular, I explore some of the possibilities and limits of this phenomenon and how it is impacting upon twenty-first century paradigms for creative practice and labour.

Keywords: user created content, social media, Japanese mobile phones (*keitai*), gender and labour practices

Introduction

In an age of convergent social media and attendant user created content (UCC) there has been much hype and rhetoric about the potential subversion of traditional media and consumption/production paradigms. Advocates such as Henry Jenkins (2006) have heralded a new era in which "participatory media" contests twentieth century "package media". Indeed, questions around production/consumption shifts from top-down industry driven models towards bubble-up, user created content have been all-pervasive. And yet, after the honeymoon of hype around user-empowerment starts to settle, the realities of convergent social media's undulating landscape appear and we are left with cartographies of multiple narratives, stories and practices. Within the various localities and technocultures we can see a diversity of practices that contest didactic models of the digital divide in terms of the haves and the have-nots. Indeed, within twenty-first century technocultures we are seeing new forms of work and class paradigms in which the "have-less" increasingly become the norm (Qiu 2008).

One obvious demography that has been overtly affected by twenty-first technocultures—in both developed and developing contexts—is women. This can be noted not only in terms of consumption and increased engagement with new media and media literacy through everyday technologies such as mobile media, but is reflected in the shifts in higher education and employment within these ICTs industries (ILO 2008).[1] As I have argued elsewhere, since the 1997 financial crisis in Asia, locations in the region have sought to rebuild and reconceptualise their economies from a series of Information and Communication Technology (ICT) manufacturing sites into models of twenty-first century informational societies (Hjorth 2009). The mobile phone has become both the *symbol* and *vehicle* for these transformations around consumption and production paradigms. It is also one of the most personal and intimate objects (Fortunati 2005), so much so that it is often personalised to the point of personification (Hjorth 2009). It is indicative of broader socio-cultural shifts in which the "personal" has become political. The recent deployment of Twitter by the Iranian protesters was exemplary that no media, however banal in its production, remains unstained by the politics of the personal.

1 Indeed, just as female paid employment (predominantly in precarious, new media sectors) has increased over this ten-year period (ILO 2008), so too have the new forms of mobile media and social labour accompanied this phenomenon. According to the International Labour Office's (ILO) 2008 report on "Global Employment Trends for Women", these increases in female employment can noted in East Asia and the Pacific whilst South Asia remains relatively unchanged with an 'untapped female potential and sizeable decent work deficit' (2008: 21). This parallel and interrelated phenomenon has resulted in the re-working of gender, labour and technology. From social intimacy to creative user content, labour has taken on various immaterial and material guises. Labour can be creative, affective, emotional, and social. It is inflected as much by culture and gender as it is by class.

I argue that one way in which to conceptualise these emerging forms of creative paradigms is through the notion of the lens of personalisation. With the ushering of ubiquitous social media, two dominant tropes of "personalisation" have occurred — one being the top-down industry-driven, with the other being user generated/created (UCC) content. It is the latter that I have been interested in as forming new modes of engagement, creativity, labour and literacy.

In an age of "participatory media" (Jenkins 2006), the role of the *personal* has taken on new paradoxical positions as the struggle of power between the industry and UCC — especially in terms of labour. Such notions as playbour (Kücklich 2006) highlight that UCC (creative, emotional, affective and social) labour, like artists, continue modes of exploitation and unpaid / unremunerated exploited under the rubric of leisure whilst industry profits. Through the pervasive rubric of personalisation and tropes of amateur / professional blurring in the form of the "prod-user" (Bruns 2007), how can we conceptualise the art of being urban today?

One way is to rethink the politics of the personal. This notion forms the rubric for this paper.

The politics of the personal: vernacular creativity and the politics of emotional and social labour

The politics of the personal can be seen as an extension of "relational aesthetics" (Bourriaud 2002) and "altermodern" (Bourriaud 2009) by emphasising the haptic navigations of the urban with the personal. Here I briefly deploy the analogy of the parkour, the alternative navigation of the urban via aerobatic type exercises. Invented by French David Belle, the art of parkour—though the act of the traceur (the person doing parkour)—can be a way of providing new ways of experiencing a city and its temporal spatiality. These are the new exercises of the urban in which artists and creative labour are shaping new cartographies that contest conventional notions of bounded spaces in the form of nation-state. I argue that the role of the personal can be seen to have the potentiality of the parkour by inviting new ways of conceptualising and moving through the city and the world. These movements involve mobility and immobility across various levels and also demonstrate new forms of creative, social, emotional and affective labour through acts of "vernacular creativity" (Burgess 2008). The personal can take the form of act between people, but it can also refer to the practice between person, technology and community in which often various spaces and places are negotiated simultaneously.

By personal, this is a revised notion, one in which affective technologies such as mobile phones and social media have added a new layer of mediation in the form of seemingly non-mediation, the personal. Indeed, conventional ideas of the personal, like the intimate, were that they were not mediated. However, as many critiques of the intimate have identified (Jamieson 2000), it is always mediated at both an individual (by gestures, memories and words) and collective (culture, locality and language) level. The personal has become global, it is about new forms of class, creativity and labour. Thus, by trying to redefine the personal in terms of locality we can see emerging forms of artistic and UCC-driven politics.

Spaces such as social networking sites (SNS) like Facebook, Xiaonei and Cyworld mini-hompy are inverting the way in which the personal played out public and private spheres. In the "emotional capitalism" (llouz 2008) and full-time public intimacy prevalent today, the personal is being redefined. According to Clay Shirky, the personal no longer belongs to people but technologies (2008). In a mediascape dominated by affective technologies like mobile phones, the personal—as with the intimate—has changed. However, unlike Shirky I would argue that the personal still relates to people, but this relationship is mediated by technologies, images and capital. It is the third stage of capital mediation — firstly there was the financial (Marx), then images (Baudrillard) and now technologies. Through the lens of these technocultures we can begin to reclaim a revised notion of the personal as political located in the shifting cartographies of personalisation. Through acts of UCC, the personal is reclaimed and relocated to people.

In my seven-year virtual ethnographic study of gendered mobile media in the Asia-Pacific I deployed two conceptual rubrics to explore the phenomenon of the personal around affective technologies. Firstly, cartographies of personalisation *(ideologies)* — that is, rather than framing the region as a set of geographies and nation-states, we see them as a series of "cartographies of personalisation". These are new technocultural

maps of the region in the 21st century. As I have suggested elsewhere, the region can be understood as a series of (ideological) cartographies of personalisation. These cartographies are both industry/technonationally driven as they are redefined and questioned by the bottom up users. It is a productive dynamic between the two top-down and bottom-up that provide fuel for new forms of digital storytelling, creativity and media literacy.

Secondly, at a micro, practice level, I deployed the notion of "imaging communities".[2] These were the micronarratives, politics and tactics that gave way to new forms of labour (emotional, social, creative, affective) and gendered forms of media literacy. UCC is indicative of these emerging forms of "vernacular creativity" (Burgess 2008). The rise of personalisation has been marked by the politics between industry "packaged media" and user "conversational media". In short, the rise of a technology and media practice can be seen as a product of the tensions between industry and user. One of the most famous is the rise of the *keitai* (mobile phone) in Tokyo by young female users hijacking the pager technologies aimed at businessmen. In order to demonstrate these revised notions of the personal as political I will explore a case study that exemplifies these new politics of the personal in which we can see vernacular creativity as well as remediated forms of older media at play. This practice is about creative forms of writer-reader paradigms that transform the context of new media through the lens of the personal. I speak of *keitai shōsetsu*, mobile phone novels.

How novel: *keitai shōsetsu*

> The cell-phone novel, or *keitai shōsetsu*, is the first literary genre to emerge from the cellular age. For a new form, it is remarkably robust. Maho i-Land, which is the largest cell-phone-novel site, carries more than a million titles, most of them by amateurs writing under screen handles, and all available for free. According to the figures provided by the company, the site, which also offers templates for blogs and home pages, is visited three and a half billion times a month (Goodyear 2008, n.p).

According to Dana Goodyear's "I ♥ NOVELS", the phenomenal rise of *keitai shōsetsu* has to do with the highly significant role played by the *keitai* within Japanese everyday life (2008). While the mobile phone is for many one of the most intimate and personal objects (Fortunati 2005) this is especially the case for the *keitai.* For many Japanese, the *keitai* is their main internet portal, thus rendering the device both a tool for communication and for information/entertainment. In a culture where long train journeys back and from work are the norm, the transformation of the *keitai* into *shōsetsu* is but just one possibility. Within the large frame of the *keitai* in Japan (to support the various multimedia capacities of the device), the phone takes the place of the book in hand on trains. What began as a 'filling in' activity within moving urban spaces soon became a fascinating interest for many thousands upon thousands of Japanese readers.

The rise of mobile media has seen the conflation between the personal and intimate. This situation is amplified in the case of the *keitai shōsetsu*. Such a conflation is a product of numerous shifting discourses around intimacy and mediated co-presence — a phenomenon that gave birth to the novel and numerous literary traditions. Thus it is important to contextualise *keitai shōsetsu* in terms of these older traditions, especially within Japan and the rise of women's writing through *hiragana* and 'kitten writing' (Kinsella 1995) — key features deployed with *keitai shōsetsu*. Moreover, *keitai shōsetsu* not only remediates older media, it is adapted and translated into those forms, highlighting the co-dependent dialogue between the various media. Far from a fetish of "newness", the odes of *keitai shōsetsu* to hard copy novels and women's writing traditions in Japan is unavoidable.

Often enduring *keitai shōsetsu* stories will move from *keitai* UCC to films and *manga*. The rise of the *keitai shōsetsu* — a short story written for the *keitai* that, in some cases, are translated into other forms of media such as films and *manga* — is a great example of the power of UCC in Japan. The *keitai shōsetsu* further extends the UCC and amateur *manga* phenomenon of the 1970s in which female produsers featured prominently (Napier

2 By "imaging" I refer to all the mobile media UCC practices that can take the form of the visual, textual, aural and haptic modes of expression. From text messages and camera phone images to *keitai shōsetsu*, these practices of imaging communities reflect forms of intimacy and creative, social, affective and emotional labour that provide ways for configuring, and intervening that shape the region's "imagined community" (Anderson 1983). Rather than the region being the sum of what Benedict Anderson (1983) calls "imagined communities"—that is, nations formed through the birth and rise of printing press and print media, what Anderson styles "print capitalism"—networked mobile media is best conceptualised as a series of ongoing, micro "imaging communities" that can span visual, textual and aural forms. Moreover, in contrast to Anderson's imagined communities that saw the rise of the nation lead to the demise of the local and vernacular, "imaging communities" further amplify the local and the colloquial.

2001). While *keitai shōsetsu* seems to herald the significance of new forms of creativity within social media, we must ask what types of gendered labour practices are being played out. Is this a vehicle for reinforcing gender stereotypes about drama and literature, or can this phenomenon be viewed as part of a broader process of empowerment and gendered performativity subversion that can be mapped back to literally transgressions such as the rise of "kitten writing" in which women used *kawaii* (cute) culture to create new vernacular forms of language? I would argue that the new media presented by *keitai shōsetsu* is a remediation of various forms of older gendered practices such as kitten writing, just as it is a vehicle for creolising old and new media genres and traditions such as *haiku* and *manga.* Now *keitai haiku* and *keitai manga* dynamically converse with such techniques.

The *keitai shōsetsu* phenomenon began with the founding of one of Japan's most pivotal UCC site, Maho i-Land (*maho* meaning "magic"), in 1999. Although *keitai shōsetsu* were initially written by professionals, by the mid 2000s everyday users had begun to be inspired to write and disseminate their own *keitai shōsetsu*. Maho i-Land provided avenues for various forms of UCC—poems, images, music and stories. It was its template "Let's Make Novels"—along with unlimited data packages for the *keitai* in 2003—that saw the dramatic rise of writers and readers of *keitai shōsetsu.* By 2007, nearly four million different *keitai shōsetsu* had become hard copy. With one million *keitai shōsetsu* being produced in 2007 and 1.9 billion page views per month, Maho i-Land has become an exemplary case of the popularity of UCC. Successful *keitai shōsetsu* such as *Koizora* have been made into films, hard copy novels and *manga* — highlighting that *keitai shōsetsu* as new media is very much in dialogue and remediated by older media.

I argue that *keitai shōsetsu* typifies a localised example of emerging gendered forms of creativity and how the personal can be viewed as political. Like the *keitai*, *shōsetsu* plays on the significance of the *personal* within Japanese tradition (Fujimoto 2005; Ito et al. 2005); a fact that can be evidenced in Japan's successful role in "electronic individualism" (Kogawa 1984) from the Sony Walkman to GameBoy. The *keitai shōsetsu* epitomises the specific role the *personal* has played in Japan upon both micro (individual) and macro (nationalism) levels (McVeigh 2004). Japan's *keitai* culture has provided a form of gendered performativity around personalisation that can be found within in different cultural contexts (of course, massaged by the local and thus taking on diverse characteristics) in the region. Through the lens of mobile media we can gain insight into localised forms of creativity, power and labour.

In the case of micronarrative practices such as *keitai shōsetsu*, we see a specific gendered politic coming into play — what I call the politics of personalisation. While earlier models of mobile phones in 1980s were characterised by industry driven personalisation, the rise of the mobile phone can be noted by a shift from personalisation being an industry-driven condition to be a subversive practice on the behalf of the user. This is exemplified in Japan by the aforementioned rise of the high-school pager revolution (Hjorth 2003; Matsuda 2005; Okada 2005). These mobile media practices must be understood as running concurrently and interdependently with the rise of female writers and "produsers" within the *manga* and *anime* amateur movement from the 1970s onwards (Napier 2001; Aoyama 2009; Freedman 2009). Today, there is a productive tension between the top down and bottom up processes of personalisation. Hence, through a revised notion of the personal as political we can gain much insight into the emerging and remediated practices that move beyond empowerment versus exploitation "participatory" paradigms in agency around media practice.

The "personal as political", with its feminist overtones from 1960s and 1970s body politics, plays a particular role in *keitai shōsetsu* given that they are predominantly written *by* women *for* women. What began as a youth-oriented activity (much of *keitai shōsetsu are* written and read on the long commuting journeys that is part of living in Tokyo) has, more recently, become a medium for women of different generations and class. Arising from older female participatory UCC practices such as amateur *manga* (i.e. *dojinshi* movement), *keitai shōsetsu* demonstrates the significant role women as "producers" have played in within late twentieth- and twenty-first-century Japanese media cultures. The shift of *keitai shōsetsu* away from just a youth prerogative (the conflation between youth and new technology is a familiar one) has indeed made the medium become a more compelling study for not only understanding the relationship between new media such the *keitai shōsetsu* and older media such as the novel but also gaining insight into Japanese women's practices of storytelling.

According to Ito et al. Japanese *keitai* culture is part of broader "personalization" techniques that can be

mapped back to the eighteenth century (Fujimoto 2005) and thus should be contextualised as part of broader shifts within industrialism and post-industrialism. However, within these broader cartographies, localised and temporalised features occur — exasperated at particular key socio-cultural and economic periods.[3] One of the key factors that ensured Japan's success of media convergence represented by *keitai* was the central and defining role *personalisation* played in the uptake of new technologies. And so, what does it mean to think about a politics of personalisation in an age whereby the "personal" is being branded with technology via industry whilst movements such as UCC attempt to claim it back for the people?

Undoubtedly, as social media and digital storytelling spreads, the attendant forms of emerging creativity, collaboration and community in the form of UCC becomes increasingly pervasive. One of the key attributes of this personalisation phenomenon is what Jean Burgess calls "vernacular creativity" (2007). Here Burgess spearheads the emerging amateur / professional nexus that has been altered networked social media. Within these new media social cartographies of UCC, users and their labour—or "playbour" in the case of gaming (Küchlick 2005)—are increasingly become co-producers or "produsers" (Bruns 2005). This, in turn, begs the question about what types of creativity and power relations are emerging within these new forms of labour and personalisation.

A key example of UCC "vernacular creativity" is *keitai shōsetsu. Keitai shōsetsu* vividly demonstrates the increasingly role personalisation plays in the politics of social media. Far from renouncing older media, personalised media such as *keitai shōsetsu* rehearsed and remediated as it converges and diverges — extending and expanding upon the women's tradition of subversive writing around new media in the form of "kitten writing" (or *kawaii* cultures) as well as highlighting the significant role women—as both writers and readers—play in the rise of the novel. *Keitai shōsetsu* is indicative of not only new forms of negotiating art and creativity, it is also exemplary of a revised notion of the personal as political.

In the face of literary critics of new media *keitai shōsetsu* highlights the significance of remediation (Bolter and Grusin 1999)—that is, new media always mediates and adapts the content of older media, which in turn impacts upon those traditional forms and revises them. This remediation is evidenced by the fact many of the successful *keitai shōsetsu* (millions produced yearly) are adapted into older media such as film, *manga* and *anime.* This practice can be seen as an extension of earlier gendered tropes of Japanese new media that was dubbed in the 1980s the "Anomalous Female Teenage Handwriting" phenomenon (Kinsella 1995).[4]

Keitai shōsetsu can also been seen as an extension of literary traditions evoked by arguably one of the novels in the world (written in 1000AD), *The Tale of Genji.* Drawing on *haiku*, letters and love sonnets, Murasaki Shikibu's *The Tale of Genji* deployed *hiragana* ('women's language' as opposed to men's *kanji*) to tell both the male and female side of the numerous lovers of playboy, 'Genji'. In this light the *keitai shōsetsu* is far from a new fad but rather deploying specific localised linguistic and socio-cultural features that I call "emotional vernacular".

Far from eroding Japanese 'high' literature, *keitai shōsetsu* invoke the art of *haiku* poetry (arguably Twitter also draws on such a tradition) as well as recalling the significant role played by female writer, Murasaki. Murasaki's *Tale of Genji* is arguably one of the first novels not only in Japan but also in the world. In this context, *keitai shōsetsu* highlights not only early models of literature but also the role female writers played in the field. Given that women were not allowed to learn the art of *kanji*, *hiragana* was seen as Japanese women's language. *The Tale of Genji* is written in *hiragana*, further reinforcing the development of a female-centred, emotionally charged vernacular. In contemporary *keitai shōsetsu* we can see *hiragana* and the female-emotionally driven favour being further extended, especially through the deployment of emoticons (*emoji*) and "kitten writing" (a hybridisation between *emoji* and *hiragana*).

3 In the case of the Asia-Pacific, whilst the birth and rise of "personalisation" as a key characteristic of post-industrial rhetoric can be noted for decades, it is from the 1997 economic crisis that we see significant transformations in its vernacular — as the region unevenly moves away from being a global site for technological production towards having increasing ideological prowess.

4 Characterised by *kawaii* (cute) transformations of the Japanese alphabet, *hiragana* (the alphabet known as women's, as opposed to kanji which was for men), this emerging genre of new media writing soon dominated mobile communication from the pager onwards — thus heralding what has been called the aforementioned "high-school girl pager revolution" whereby female UCC hijacked (through personalisation techniques) technologies industry had aimed at businessmen ('salarymen').

Through *keitai* UCC we can see many examples of female users finding inroads into creative activities. Thanks to UCC orientated organisations such as Maho i-Land, these users can be empowered on various levels — sharing and collaborating on stories as well as potentially making a career, and gaining professional recognition in the form of book publishing or film contracts. Far from *keitai* cultures eroding the significance of older, remediated media such as *manga* and film, they are providing new material for and interest in adapting stories by everyday users. The tendency of customisation to be cute — or what Brian McVeigh called "technocute" (whereby the cute makes warm new technology) — has taken various guises and turns in the rise of gendered new media in Japan. It has been an important part in women gaining access and feeling comfortable with the emerging technocultures. The fact that "kitten writing" has now part of the industries' gender scripting (i.e. the *keitai* now comes with increasingly varieties of *emoji*) highlights how the UCC feminised practices have not only a long tradition — they have become institutionalised.

Conclusion: the shock of the personal

In Japan, we can see that creative labour around mobile media and Web 2.0 drawing from the history of gendered genres of expression such as *gyaru-emoji* (girl emoticon), *hiragana* and kitten writing, has transformed into a multifaceted industry of popular *keitai shōsetsu* and is now being adapted into other media such as film. Women's stories are being heard. Millions of micronarratives are written, millions of readers appreciate and enjoy. These stories take flight across a variety of old and new media — with the *keitai shōsetsu* reinvigorating other media canons such as *manga*. Here we see that mobile media as new media is undoubtedly remediated with *keitai shōsetsu* feeding back into older media such as printed novels, *manga* and film. Through Web 2.0 SNS media such as 2ch and mixi, community storytelling is taking on new value again, featuring the rise of female directors, creators and producers. These practices are creating new forms of gendered labour, art and new media that rethink the personal, often the moving space of the urban (particularly trains).

As I have demonstrated through the *keitai shōsetsu* example, the rise of affective technologies such as social media has been accompanied by UCC practices — often with subversive results. *Keitai shōsetsu* can be seen as part of the kitten-writing phenomenon that began in Japan in the 1970s — accompanying the birth and rise of personal technologies. *Keitai shōsetsu* extends three traditions — the gendering of *keitai* culture, the gendering of Japanese language and the significant role female writers such as Murasaki have played in the birth and rise of the novel. For these three reasons and more, it is hard to ignore the role of *keitai shōsetsu* as not only evoking the personal but also linking it a political currency in which gender is mobilised as a form of performativity and potential subversion. Thus through the example of the *keitai shōsetsu* we can revise notions of "the personal as the political" in light of changing paradigms for art and new media.

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BIO

Dr. Larissa Hjorth is artist, digital ethnographer and Senior Lecturer in the Games and Digital Art Programs at RMIT University. Since 2000, Hjorth has been researching and publishing on gendered customising of mobile communication, gaming and virtual communities in the Asia–Pacific — these studies are outlined in her book, *Mobile Media in the Asia-Pacific* (London, Routledge). In 2009 she began her ARC discovery fellowship with Michael Arnold exploring the role of the local and online with communities in the region. This three year cross-cultural case study will locations such as Tokyo, Seoul, Shanghai, Singapore, Manila, and Melbourne.

Hjorth has been practicing art for over a decade and has received grants such as The Australia Council new work fellowship (2006), Australian Council Tokyo studio (2000), Akiyoshidai International Art Village residency (2002) and the Asialink Seoul visual art residency (2005). Hjorth has had over 10 solo exhibitions at institutions such as EAF and CACSA, participated in over 50 art exhibitions (such as *Yokohama Triennale 2001* with Japanese Internet group, Candy Factory) and curated many cross-cultural and social commentary projects such as the Japanese and Australian magazine and exhibition project, *gloss* (2002).

Earth Pulse: vibrational data as artistic inspiration.

Cat Hope

Abstract
The use of scientific data to create artworks has always played an important part in the arts, and music has been no exception. The impact of developments such as electricity, the phonograph, the cassette recorder and the now ubiquitous computer on the aural arts is well documented. This paper looks at a different influence however; the use of scientific data as a source for musical artworks, in particular the use of seismic and other low frequency data logged in various formats. As sound art offers different ways to experience aural media, this paper looks at some artists who have experimented with methodologies to create works using meteorological, geological and hydrological data.

Keywords
Music – vibration - sound art - installation

Introduction
"Imagine: everything you hear now was very, very slow, very, very wide" (Hess 2001, 127)
Audible sound for human beings - known as the audio frequency range - spans approximately from 20 Herz (Hz)– 20kilo Hz (or ten octaves, using musical language). The threshold of hearing is defined as the point at either end of this range where the sound is no longer audible to the human ear, and our hearing ability gradually fades. The hearing threshold varies slightly from person to person, and depends on a variety of factors – loudness, the age of the listener, past hearing damage and the environment in which we listen (Leventhall 2008, 12).

Infrasound is a term used to define sound below the audio frequency range, that is below 20 Hz. Sounds below this threshold can be audible if they are amplified at sufficient volume, but the ear does lose its ability to define pitch or even a tone (ibid.,13). Whilst infrasonic microphones can record signals as low as 0.1 Hz, the reproduction of these sounds is a problem. Powerful amplifiers can generate enough volume yet speaker design struggles with efficiency issues in relation to low frequency reproduction. Most amplified infrasound we hear is the sound of the mechanism engaged to reproduce it.

Infrasonic information that has been collected for scientific purposes can be altered to become audible by transposing the infrasonic range into the audible range. This most often involves a literal transposition which involves the 'speeding up' of a recording, transposing it to a high enough pitch that is in the general audible range, which also makes the duration of the recording shorter. Another method is to assign tones to data and then applying the relationships existing between the data to sonic relationships. But importantly, the source material needs to be composed. That is, to consider them as art or music they need to be organised, contemplated, created and/or controlled to some extent.

Where is infrasound found?
Infrasound occurs commonly in the natural world, where most infrasound recordings are made. Certain animals emit infrasound, usually for communication purposes. This includes whales, giraffe, alligators, hippos, rhinos, lions, okapi, tigers and several birds. For example, infrasound is used for long-distance communication in African elephants allowing communication for up ten kilometres. Their calls range from 15-35 Hz and can be as loud as 117 dB (Larom et al. 1997, 421). Man made infrasound is also common, usually as a by product of heavy machinery such as air conditioners, ferries and aircraft engines, but also sonic booms, explosions, sub woofer speakers and even travelling in a car at speed with the window open (Bryan and Tempest 1995, 398). The Comprehensive Nuclear-Test-Ban Treaty Organization looks for infrasonic signals as one of its monitoring technologies. But it has been the infrasound emitting from nature that has provided the majority of stimulus for artists to date. Wind, rain, ocean surf, avalanches, lightning

and thunder all emit infrasound to varying degrees (Marrin 2004,1). The infrasonic sound wave that is generated by a volcanic explosion can be so large as to propagate around the earth several times. Explosive volcanic eruptions and other related activity such as earthquakes are recorded using arrays of infrasonic microphones and notated with seismographic plotters.

Environmental Infrasound translated: composing with data
American artist John Duncan (b1953) created a composition released as a CD recording entitled *Infrasound – Tidal* (2003) that features a variety of infrasonic sounds transposed into audible ranges. It features the musical manipulation of tidal, atmospheric pressure and seismic movement data provided by Australian acousticians Densil Cabrera and Arie Verveer. The source material is fundamentally scientific audio representations of scientific data that follow meticulous rules of time compression as to make them workable. Duncan manipulates them into four movements coming together to form just over 41 minutes of unique musical representation of scientific inquiry. The piece is divided into four interlocking sections.

The tidal recordings are based on tidal spectra collected from sixty ports around the Australian coastline. These sounds have been resynthesised using sine tones and sped up 32 million times allowing one year of tidal activity to be translated into one second of audio. The different strengths of tides at varying locations are evident and the period of the sound waves can range from 23 to 24 hours in length. The spectra consists of around 20 diverse frequencies, and as raw recordings (available on Cabrera's web site) create extended, sinuous sounds with gentle undulations and interesting harmonic relationships resulting in strange chords and volume combinations of the different components unique for each location. Duncan plays with these sounds using stereophonic effects, adjustments in volume and slight changes of sound colour. The result is a smooth drone coloured by minuscule detail and phasing effects.

The seismic data featured in the release was recorded using seismometers located on the property of Arie Verveer in Kalamunda, in the foothills near Perth, Western Australia, in 1998. Unlike the tidal material, these were recorded in stereo creating an audio image not unlike that recorded with an eight microphone array. Seismometers have a dipole sensitivity pattern, so the North-South data and the East-West data were used for the two audio channels. A wide variety of activity was recorded, including a nuclear test in India, an earthquake in southeast Taiwan and varying local micro-seismic noise. The original material was recorded at a sample rate of 40 Hz and was converted to the standard audio format, 44100 kHz by Cabrera. These produce very different recordings to the tidal information, as defined events can be heard – clicks, pops and rumbles, with a surface noise not unlike record hiss. There is a lot of down time in these recordings that are full of smaller detail. The earthquakes sound like an explosion, the nuclear test has a lot more spiky and discontinuous activity. Duncan respects these spaces and junctures in his manipulation of the material, and uses the more defined sounds to bookmark the start and end of this lengthy middle section of the piece.

The third component consists of barometric data obtained from the Australian Bureau of Meteorology, measured at Laverton and Williamtown Air Force Bases over a fifty-year period. The sample period for these recordings was usually around six hours and the data was supplied in text format. Cabrera devised a simple computer program that converted this text into a sound file. The atmospheric 'tide' and sudden pressure changes can all be heard in the short rather raw sound files. They combine the drone texture of the tidal recordings with the hissy nature of the seismic. Continuous tones are layered with spiky, yet constant sounds, at times sounding like a distortion effect. As with the tidal recordings, the resulting sound was sped up so that one year's record corresponded to one second of playback - that's about 32 million times faster than the original recording, and here we have some 48 years of data. As a result, the yearly tide is compressed into these small sound bytes. Duncan's manipulation of them results in the most low frequency part of the piece, the drone here is a rumbling, cavernous almost machine room like atmosphere, swaying

through rolling and gently surging patterns.
Duncan initiated this project after he noticed a forum post by Cabrera offering up his recordings for use. Duncan had never met Cabrera – any communication was by way of email and not much communication re the use of the recordings seems to have been made. Cabrera's sounds had also been used by choreographer Tess De Quincey in her site specific performance work, *Form of Scent* (De Quincey Company, 2001). Duncan points out that he has destroyed what he calls the 'inherent linearity of the scientific data', modifying the sound into layers and destroying its original shape (Duncan 2003). There are three elements of construction in the work; the data collection, its translation by Cabrera and the musical composition process applied to it by Duncan. These long dark, dense and continuous pieces play with the idea of listening to the world beneath and around us. Listening to this recording is like being underwater in a vacuum, where the slightest change in the texture of the sound becomes a significant event. It reflects Duncan's interest in the nature of drone, and this recording investigates a variety of them: humming, buzzing, scraping, pure and dirty. Reviewer Daniela Cascella proposes that Duncan's intention is to suggest the atmosphere of scientific research: the isolation, the long flow of eventless moments before arriving at a relevant discovery (Casella 2003).

Air Pressure Fluctuations – from scratch
Dutch sound artist Felix Hess (b1941) began his career as a physicist and started making art in the early 1990's where he became known as a sound artist working with semi-autonomous sound machines. Hess describes his interest in sound as being an interest in sensitivity, and is preoccupied with creating works that listen (Schultz 2001, 37). He prefers the term 'air pressure fluctuations' to infrasound, a literal translation of what all sound is, but more specifically the way infrasound is experienced by us. His work *It's In the Air (cracklers)* (mixed media installation, 1995) uses small machines that indicate changes of air pressure as short clicks. After extensive testing in his own home, Hess found these machines sense not only the weather and wind but also the opening and closing of doors, the movement of human bodies and activities many meters away (ibid., 60). By transposing very low volume, low-pitched recordings of air movement into articulations of the audible range Hess's installations and instruments make complex patterns of vibration and movement appear to our senses as audible qualities.

Hess's recording *Air Pressure Fluctuations* (2001) is a single 20-minute recording taken in the coastal town of Noorlaaren, The Netherlands, where infrasonic microphones are placed some 64 meters apart and set to record for five days (Hess 2001, 126). The recorded infrasonic air pressure changes are presented at 360 times their original speed to allow them to become audible. Here all the recording and transposition is done by the artist himself using self-constructed tools such as a number of digital microphones. These are fed into computer software by way of a sound card and manipulated by Hess.

As a result of the transposition process on *Air Pressure Fluctuations,* one second of sound on the Compact Disc is equivalent to six minutes of original time. An hour of sound, as featured on the disc, is a translation of 15 days and nights. Likewise, the recorded sound range between 0.03Hz and 56 Hz is transposed to between 18Hz and 1800Hz. This creates radical changes in the original recorded material and Hess suggests characteristics of these new sounds. What was originally the deep rumbling of a factory he describes as a high pitched, insect like sound (ibid., 64). Every four minutes indicates the start of a new day where he identifies there is a flurry of activity. Hess even claims to be recording microbaroms, a sound created by standing water waves on the very top of the Atlantic Ocean. Transposed, they sound like a very low drone, almost an aircraft engine. These create signals of less than one Hz, so even transposed they are still technically infrasound. In this recording, sounds we would not normally notice due to their low pitch and volume become clear and articulate. Others are completely transformed, unable to represent their source even when we know the sounds origins.

Air Pressure Fluctuations presents a series of high-pitched whistles, beeps and buzzes, some recognisable as natural sounds, others lost in the translation and becoming something new. Sounds such as the opening and closing of doors, machines and vehicles are redescribed from kilometres away. In this process nature and the man-made change places, they filter each other. These are not simple representations: rather they are interpretations through time, space and capture.

Sounds of Decay - in real time

In my own work, I have investigated low frequency sounds emitting from decaying matter as part of the sound art collective *Metaphonica* with sound artist XXXX. During a 2005 artists residency at the art science laboratory Symbiotica, we initiated a project entitled *Sounds of Decay* (multi media installation, 2005 to date), where methodologies for recording infrasound using time lapse were investigated. Unlike Hess and Cabrera, *Metaphonica* was not interested in transposing the sounds we recorded. Rather, we wanted to filter the frequency range of the sounds to record, keep all the sounds in their original length, and join them together into a large loop that grew in real time. To facilitate this combination of requirements, a MaxMSP program written in association with XXX was devised to control the desired frequency range to be recorded, and to be recording continuously so as to enable the recording of any sound to begin at the very start and absolute end during the slow decay process of a dead animal in a controlled environment (interface illustrated in Figure 3). The program would dispose of recordings outside our preset frequency range s well as recordings of silence, and then send any saved recordings to a simple itunes loop that would grow longer as material was added. The preset range for recordings was 10 to 40 Hz, determined after investigations into recordings of insect activity. Recent research into the European House Borer, a destructive pest in pine forests, has demonstrated that listening for low frequency sounds is the best way to detect insect behaviouri. We used a hydrophone inserted in the decaying corpse and a peizo microphone on a skin surface to record the audio.

The sounds are not dissimilar to Cabrera's seismic sounds – there is a lot of small detail (usually flies and fluid movement) layered over notable 'events' (such as the collapsing of sections of the corpse). After these initial experiments in the field we plan to exhibit the decaying animal (which has been a guinea pig in our first experiments) in a controlled environment so as to speed up decay and contain odours, alongside the building loop of live and recent sounds played back through a sub woofer system. The sound pressure level is adjusted to enable audibility of all sounds – lower sounds are boosted by way of volume, not altered in any other way. This is in an attempt to keep association between the sounds and the process linked – the data is as it sounds (there are no sine wave versions of data as provided by Cabrera) and the sounds, whilst they may surprise, do connect with the sound source as it is presented simultaneously in the room.

Conclusion

Humans can hear over ten octaves of sound as mechanical vibration, yet only a single octave of light as electromagnetic vibration. It could be said that as a result of this, our hearing provides a more robust sense of our environment. Yet these artists are looking to extend our encounter of reality even further by transforming the normally inaudible into the human hearing range. *Infrasound – Tidal*, *Air Pressure Fluctuations* and *Sounds of Decay* are works that listen. They operate at a timescale beyond the normal linear perspectives where music often operates. Rather than simply seeking to evoke a feeling of timelessness like most drone music, these infrasound recordings work on a concrete timescale that is simply larger than humans can usually comprehend. Like the notorious *John Cage Organ Project,* which presents Cage's relatively short keyboard composition entitled *ASLSP (As SLow aS Possible)* (1987) over a period of 639 years, these works examine time. They take natural processes that would normally defy comprehension and transform them into a human timeframe, evoking the mystery of the earth's natural rhythms.

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i Associate Professor Adam Osseiran in Edith Cowan University's Electron Science Research Institute uses infrasonic microphones to identify, characterise and differentiate the sounds of the European House Borer larvae.

Bush Video

Stephen Jones

Bush Video was a unique collaborative video operation running on an unconsciously anarchic model. It was the seminal organisation through which video in many of its forms was established in Australia. Established in 1973 by Joseph el Khourri and Mick Glasheen, it's initial role was to develop a cable network for community video at the Aquarius Universities Arts Festival held at Nimbin in May 1973. When the people who assembled around this task returned to Sydney after the festival Glasheen's studio space in Ultimo became the centre for Bush Video activities. Video recording of local cultural events, alternative architectural discussion, film-making and computer graphics production as well as the development of new technical capacities particularly in video synthesis and electronic music as well as the deeper engagement of other artists in the experimental arts of the time meant that there was a constant flow of production and a regular display of new work through the Bush Video Theatre that occurred on weekends in the studio. In 1974 Bush Video moved to Guriganya in Paddington, and continued its operations with ongoing and new involvement from people who were also attracted to the loose network structure and its experimental activities. I will explore its activities and work produced through its two year history.

In 1972 Mick Glasheen, who had abandoned his studies in architecture at the University of New South Wales (UNSW) in favour of experimental film-making, and Joseph EI Khouri, who graduated in arts at the University of New England (UNE) and whose interest in film led to him moving to Sydney and subsequently Melbourne to make his own films, met in central Australia when they became involved in a Pitjantjajara inma or large ceremony. El Khouri was part of the team providing infrastructural support for the inma and he and his friend Melinda Brown were also there filming for his Ascension of the Rainbow Serpent (El Khouri 1973). Meanwhile Glasheen had been filming time-lapse landscapes and sunrises around Uluru along with ìfootage of [the Pitjantjajara elder] Lively Number One walking round the rock, telling the stories.î (Glasheen 2005)

At previous stages in their lives they had both been inspired by Buckminster Fullerís talks on the integrated nature of the global biological, engineering and communications ecology, and subsequently they had both independently been introduced to video; Glasheen when he recorded a series of Buckminster Fuller lectures at UNSW and El Khourey in working with Bert Deling on his film Dalmas, when they used an Akai 1/4î portapak to film some tripping scenes. El Khourey had been reading about video in the magazine Radical Software and wanted to get into the experimental realm that video offered.

On a previous trip to Uluru, Glasheen had realised that he should be using video to record the stories, so on this second trip he and Jack Jacobsen (aka Fat Jack), who was providing the technical support, brought along a borrowed Sony 1/2-inch video portapak. (Glasheen 1978) Glasheen heard on the grapevine about the inma and they travelled to the site where they recorded hours of video. He says of this experience that it was his

"first extensive experience with [portable] video, Ö and that was not doing any electronic effects that was just recording aboriginal stories really, or aboriginal corroborees. I did one experimental tape, just following footprints in the sand, just animal tracks and things, at dawn. And I thought this is so amazing, to spend that amount of time. (Glasheen 2005)

Nimbin

When Glasheen returned to Sydney from Uluru he moved into a vacant floor of the Fuetron [1] building, a factory building at 31 Bay St, Ultimo, which was then owned by John Bourke who had studied architecture with Glasheen at UNSW. Glasheen moved into the 4th floor to set up his studio so that he could edit the material he had shot at Uluru into an intended film about the mythic ëscienceí of the aboriginal dreamtime. (Glasheen 2005)

Around February 1973 Johnny Allen, cultural director at UNSW, and Graeme Dunstan had been travelling to all the universities in Australia to enthuse the students about the Australian Union of Studentsí (AUS) Aquarius Arts Festival (to be held in Nimbin, northern NSW, in May 1973) of which they were co-directors. They visited Glasheen to talk about making a film of the Festival and to set up a video co-operative as one of the projects, and they were going to apply for funds from the Film and Television Board (FTB) of the Australian Council for the Arts. They had also been speaking to El Khouri and others in Melbourne and Adelaide, and had written to ìHoppyî Hopkins in the UK which led to John Kirk returning to Australia to join up with the project.

One aspect of the Nimbin festival was that it might provide a space in which to develop ideas leading to a democratic and accountable media. This was partly introduced by a Canadian visitor, David Weston, who suggested that a community media centre should be operated within the festival township. (Anon 1973) A meeting was organised in February 1973 at Nimbin to discuss arrangements for setting up the infrastructure.

Both Glasheen and El Khouri were present and decided to get involved. However Weston was unable to stay for the Festival and so it fell to El Khouri and Glasheen to organise the media centre. The main aim of the project was to introduce interested festival-goers to video so that they could go out and record festival events and then broadcast these out around Nimbin and the festival site through a collection of TV monitors to be placed in the main sites of the festival, eg, the Rainbow Café.

El Khouri and Glasheen decided what equipment they would need and El Khouri wrote an application for funding which was presented to the FTB under the banner of the Australian Union of Students (AUS). They received $15,000 with which they purchased a Sony and two National 1/2- inch portapaks, a colour 1/2-inch video tape recorder, a small studio camera, lights, video tapes, a van to carry all the equipment, and enough coaxial video cable to cable up the township and the main areas of the Festival. According to Glasheen, in the two months before the festival

“A lot of people just gathered around Fuetron, they heard that there was going to be this great festival on and there was this place, Fuetron, where you could come and ... people would kind of squat there. So I remember Jonny Lewis arrived, and he was excited, with his girlfriend Ann Kelly. And then John Kirk arrived, and heíd just arrived from England and heíd heard about it in England. Johnny Allen had actually sent some communication off to John Hopkins about doing this video thing in England. And other people who were friends of mine, like Tom Barber and Jack Meyer and Fat Jack and people who had helped me ... do experimental film things, ... joined in. So it was this amalgamation of old contacts I had and new people.” (Glasheen 2005)

This band of artists, film-makers, architects and others made their way to Nimbin over the weeks before the festival. A video distribution hub was established in a house near the centre of town, and the work of laying the coaxial cable network began. It took nearly the whole period of the festival to get the cable laid but it did happen and towards the end of the festival videos that had been recorded during the festival were shown on the network.[2] Bush Video had been maintaining and lending out the portapaks to all comers and many tapes were shot. El Khouri made several tapes, including recordings of some of the main events such as the Dollar Brand and Bauls of Bengal concerts, and there were many other tapes shot, from play in the swimming-hole to trips into the surrounding landscape and whatever was happening in the Festival. To a large extent the festival participants had little experience of film or video making, and as Glasheen noted, during the festival

“all these tapes came in, but we kept on not having enough tapes and recording over the tapes and not putting any value on what was recorded. Because when I was seeing it, it didnít look like it was all that valuable anyway, you know. Much of it wasnít well recorded. (Glasheen 2005)

Bush Video

When the Bush Video team returned to Sydney they moved back into the Fuetron building and began to edit the Nimbin videotapes, but editing in those days was a very tedious affair and little was achieved. However, now the experimentation started. Although the group had a constantly changing configuration Bush Video

functioned as a loose collective of artists that somehow managed to work together for nearly two years. Through its Video Theatre evenings the studio space in the Fuetron building became a regular gathering place for the members and their friends to try things out, discuss projects, gather collaborators and to show the results of their production. The primary video work was highly experimental with a considerable degree of synthetically generated imagery, bits of computer animation, and Glasheenís time-lapse sunsets, sunrises and skyscapes, along with portapak video gathered from Nimbin and the city and the performances of dancers and musicians who joined in regularly.

Bush Video was still affiliated with AUS and, in August 1973, published the Bush Video edition of Tharunka which was intended to introduce the many facets of video to the students at UNSW. [3] It summed up much of the general politico-aesthetic thinking of the time, not so much for the ìfine artî world as for the experimental art world, whose interests were both an expression of the ideology of transcendence and the recognition of the ecological linkage between the biosphere and the development of the community both environmentally and spiritually. The Bush Video studio established in the Fuetron building included the video monitors from Nimbin now set up as a wall of screens with the cameras in front of it for feedback or to record performances. Along the opposite wall was a control-booth with the recorders and the mixer and whatever equipment they were able to build or borrow that could help make interesting electronic video. [4] One piece of equipment that made an irregular appearance was a video colouriser, [5] which was used to colourise the feedback effects that were so much a part of what Bush Video produced. Other equipment included an oscilloscope used for making Lissajous figures and a video synthesiser built by Ariel.

Beyond the ecological community aspects of the ideology of video there were the aspects of spiritual transformation that video seemed to represent, especially through the use of feedback as well as its more synthetic images. Glasheenís description of the attraction that video had for him illustrates:

“I was drawn to the organic nature of it, Ö it seemed to me that video and electronic art is really an image of Ö It’s light energy! Electromagnetic fields that are made visible! And so I thought: This is amazing! That we’ve got our hands on thisÖ Just like ... the first time I saw a television image I couldn’t believe it. You know, there’s this glowing cathode tube with an image there that was alive. So I just felt that this is a new life-form, when you’re doing the feedback effect of video. Bush Video pursued hours of this feedback... Then I was feeling drawn to that because it was this kind of... it seemed to be that that’s where the life was... in this machine”. (Glasheen, 2005)

This transformative idea extended into explorations of the synthesis of new realities. El Khouri described it as ìthe mythological version of videoî. He went on to say: I was obsessed with these two areas of alchemy and memory theatre because I read this book of Frances Yates... her books on Giordano Bruno (Yates 1964) and The Art of Memory (Yates 1966) ... and I was reading Jungís Mysterium Coniunctionis (Jung 1956) Ö [I was] fascinated by science but also fascinated by the roots of science which was this occult and alchemic kind of tradition which has this almost eastern Tantric thing in it. So my idea was to combine all of these things Ö the feedback... and [how] it transforms your personal life. Cinema as a process of transformation. Then moving into video because itís much more accessible and malleable to the personal. Ö and of course then we discover this metaphor of the effects mixer and the video process where you can make this state of heightened consciousness where everything changes colour and reality becomes a malleable transformable metamorphosing exhibition. (El Khouri 2009)

As Ariel described it, much of Bush Videoís production involved remixing stuff that was captured with a camera. Ö One of the schemes was that youíd actually have all these banks of monitors sitting against the wall and then youíd have blank areas and thereíd be like film being projected on parts of the wall. The whole place would be dark and Ö youíd be shooting the thing so it was like doing compositing with the camera plus mixing with more than one camera, and also colourising mono[chrome] sources, and so forth. (Ariel 2005)

Generating interesting video feedback was one of the main things Bush Video explored, although many of the best feedbacks never got recorded. You had to set up the video and then finesse the system to do what

you wanted to do. (Glasheen 2005) Feedback is a decidedly evanescent process and the most beautiful effects can be lost by the slightest change of conditions. However some tapes did get made. The most important was Meta-Video Programming which was commissioned for the Philip Morris Arts Grant [6] by James Mollison, then director of the National Gallery in Canberra.

Bush Video also had connections to Doug Richardsonís experimental computer graphics facility based on the PDP-8 mini-computer that he had developed at the University of Sydney, (Jones 2008) and to some of the more radical, ecologically oriented members of the architectural community of Sydney. Having studied architecture, Glasheen had a strong interest in the geometry of space, both architectural and microphysical. He had been doodling around on the PDP-8 system, drawing and animating 3D objects, especially the tetrahedron, which represented for him the fundamental geometry of the microcosm. These animations were then recorded and incorporated in the mixdowns of electronic imaging that Bush Video specialised in, for example, the ìcircle and square and triangle, the old Taoist patternî (Glasheen, 2005) appears in Meta-Video Programming.

Money was always tight, despite support from the FTB, and in early 1974 Bush Video had to move out of the Fuetron building. They were fortunate enough to be invited to live in an old mansion on Oxford St, Paddington. On the land behind the mansion there was an independent school called Guriganya. So Bush Video moved in, continuing their video activities, and became something like mentors for the kids who were students at the school. One of the more surprising results of this move was that right across the road the FTB had set up City Video, the first Video Access Centre in Sydney [7], and the National Resource Centre, which was to be the hub of the nationwide network of access centres they initiated under their local version of the community media project.

Bush Video continued as a centre for the experimental community around the art, architecture and theatre scenes in Sydney. They recorded plays at the Nimrod Street Theatre and provided assistance to many other people who were developing an interest in video. One of the early members, Martin Fabinyi along with John Kirk, produced The Vacuum, another important early video work, which was a TV talk-show send-up featuring Sylvia and the Synthetics, who were part of the early revival of cabaret in Sydney in the 1970s. There was a show made with the White Company who were a group of travelling players in the model of the medieval Mummers troupes. El Khouri finished a couple of complex, multi-layered mixes of synthesis, feedback and naturalistic video. One was an alchemical work called Mysterious Conjunction and the other, Ajit Mookerji Speaks was built up from a recording of Mookerji lecturing on the principles of the Tantra.

Bush Video at Australia 75

In January 1975 Bush Video was invited, through their connection with Doug Richardson and their general role in the electronic culture of the time, to participate in the Computers and Electronics in the Arts exhibition that Richardson was organising for Australia ë75, to be held in Canberra in March 1975. There was already some stress in the group and this proved to be their last major activity together, but even then it was fractured. They drove the van down to Canberra, set up the dome and camped out at the Commonwealth Park site. Ariel and El Khouri set up the monitor stack and video players, as used in the Bush Video Theatre evenings, in a wall of monitors on the stage of the Ballroom of the Lakeside Hotel in Canberra and showed the mixed tapes of feedback, computer graphics, synthetic and colourised video that Bush Video had made over the preceding year and a half. Ariel has said:

“At things like Australia ‘75 we just used what was available at the time. We had about ten vcr’s and monitors all stacked in different ways and in a darkened space you could actually see all these separate tapes running at the same time so you could get a mix, if you like, in the viewing space of all these different computer and analogue generated video sources”. (Ariel, 2005)

After Australia 75, Bush Video broke apart, never moving back into Gurigunya, with members going off in their different directions to follow up their separate interests.

In conclusion

We can see here from this early work that video experimenters in Australia were very aware of its peculiarly electronic aspects as well as its simple ability to record a naturalistic image from the camera. Some of the video artists considered that they were working towards a new secular electronic notion of the divine. Much of this is brought out in Glasheenís ìCommunication as a Conscious Experience of Energyî (Glasheen 1973) and El Khouriís discussion of video as a memory theatre, both of which appeared in the Bush Video Tharunka. (El Khouri 1973) The use of the electronics and the computer was to make video based on the intuitive sacred geometry that they felt was an important aspect of this new communication. In curatorial terms the most important outcome from Bush Video was Meta-Video Programming. However, possibly the most valuable result from Bush Video was its impact on the local culture. A large number of people had been exposed to the wide possibilities of video through Bush Video and went on to pursue all sorts of interesting careers, most of which continued to involve video making.

Notes: 1. The Fuetron building was named after John Bourkeís brand of furniture which was sold from the ground floor. 2. John Kirk [telephone conversation, 5 November, 2005] reminded me that the cable network was regarded by the Post Master Generalís Department (PMG) as being significant enough for the PMG Research Department to have a teleconference with Glasheen and Kirk about the project at the time of the Festival. There is a transcript of the conference in the Bush Video Tharunka, [Glasheen et al, 1973, p.14.] 3. Conversation with Mick Glasheen recorded on 14 May 2005 at Palm Beach. ìThe Bush Video Tharunka happened after weíd come back from Nimbin, only about two or three months later. Ö [while] we were still part of AUS. This was a University of NSW publication. ... we were still in touch with the university to actually bring out the uni paper as a whole Bush Video edition.î 4. Ariel listed the available equipment: ìwe had a whole stack of monitors, and a colour video open reel recorder and maybe one colour camera and a few black and white cameras, video mixer and then a lot of this other stuff that was just built by Fat Jack [Jack Jacobsen] or Mad Jack [Jack Myers].î (Ariel 2005) 5. This was one of the first commercially available colourisers and was developed in England by the Michael Cox company. The ABC and probably other TV channels or production houses used them for title colourising. 6. The video was included in the The Philip Morris Arts Grant 2nd Annual Exhibition, 1975. It was then shown in the National Gallery of Victoriaís ìPerformances Documents Film Videoî exhibition in September 1975. 7. Which in 1976, moved to the Paddington Town Hall as the Paddington Video Access Centre.

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Immediacy of Image – Image of Immediacy

Live Media Art in Japan between Tradition and Hypermodernity. An historical and contemporary View

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ABSTRACT

In 1970, French philosopher Roland Barthes declared Japan as a model for a kind of system liberated from any (Western) signification-overload, at an important moment in time when art in the West as well as in the East began forming an alliance with technology. The emergence of the new medium video then became symptomatically representative of and a contributor to the changes that occurred. Its inherent function as an 'electronic mirror' unfolded, not least through its direct cultural use: it remains a symbol in the West because it is still regarded as subject-loaded and therefore exposed to the reproach of narcissism, whereas the East regards it as a signifier for the emptiness of symbols.

In Japanese linguistic usage the word Art is understood in a wider sense of Life and the World in their multiplex manifestations. This is of course both traditional and '*hyper-modern*', understood as an experiment, an attempt to say something new – just as, in the early days of the *Gutai*-Group, J. Yoshihara ordered to his pupils not to do anything that anybody else would do: an effort to go beyond the commonly accepted boundary of our daily reality, to think and to live in a different way.

KEYWORDS

Renga, Closed Circuit Video, Interaction, Liveness

Gutai

Any survey of Modern Live (Media) Art in Japan should probably begin with an excursus back into the 1950s and with the mentioning of the first artistic group in Japan that reached international significance: The group called *Gutai* was established in 1954 in Osaka and it played a major role in the process of mutual influence between Western and Japanese art in the 1960s & 70s. The name – '*Gutai-ha'* – expressed the Zen Buddhist ideal and an apeal for spontaneity and directness linked to the ability to express feelings and thoughts in an immediate way. [1] The body played a very important role; another major interest of the group was direct contact with the landscape and the spontaneous treatment of natural materials and colours as well as a very significant inclusion of the audience. An often quoted example of a *Gutai*- live performance is a 20 minute *koi* or action by Kazuo Shiraga in 1955 involving '*Doru ni idomu*' (*Mud-Fighting*), where he asked the audience to participate by making mud-sculptures. Another one is Saburo Murakami's, which he entitled*Kami wo yabureru* (*Paper-Destroying*).

There was obviously a link between such actions and the action-painting methods of Jackson Pollock in the US, who is also rightly regarded as a cultural initiator of the Happening as an art form there, one of the first performative and participative art forms after WW2. The mentioned actions by Shiraga and Murakami took place within the first *Gutai*-exhibition in an enclosed space in October 1955 in Tokyo, one year after the *Gutai*-magazine appeared in English for the first time. In 1958 another *Gutai* exhibition was mounted, but this time at the Martha Jackson Gallery in New York and this exhibition was also known as the birth of the American happening. Just one year on, the installations with the monochrome canvasses and shining electric bulbs by Atsuo Tanaka and Michio Yoshihara during the *Gutai*-exhibition in Turin influenced a European group then forming there under the name of *Arte Povera* and which would itself become an influential force in contemporary art. .

Conversely, the direct influence of European abstract painting on the *Gutai*-Group is undisputed, initiated as it was in the visit to Japan of Japanese Painter Norio Imai, together with the major theorist of *L'Art Informel,*' Michel Tapié, and the French painter Georges Mathieu. This visit took place in September 1957, and already during the fourth *Gutai*-exhibition in October of the same year the actionist current was displaced by the pictorial one, obviously influenced by the visit of the French delegation. This new paradigm was later recognized as 'an immediate fall of the creative potential' of the Group. [2]

In the 1960s painting was to determine the politics of the group, not least because of its privileging by Jiro

Yoshihara, who was also the financer and a kind of 'father' of the *Gutai* Group, until his death in 1972.

At the same time, gradually, Japan became the major international force in the development of electronic technology, especially video with *Sony* and other well known companies. The development of early media art in Japan should be put in this context, between her persisting cultural and artistic tradition and her very fast industrial development.

Yamamoto

A good example is the Japanese Artist Keigo Yamamoto (b. 1936). From 1972 on he constructed his first Live-Video installations (also called Closed Circuit Video installations [3]) *Mimic* and *Copy*, understood also as 'Video Games'. They were actually designed to make an observer an active participant and they wouldn't have been possible without the inherent properties of the video medium – of recording and transmitting the audiovisual signals instantaneously. In his technical experiments Yamamoto saw at the same time the possibility of analysing the concept of Interval, *ma*, which is so important in Japanese culture. *Ma* is a key notion in Zen Buddhism and pervades everyday life in JapanIt also becomes manifest in the ideals of 'aimless' thinking and meditation, something paralleled again in the Japanese bias in favour of acoustic perception as compared to the greater directness of the visual as we know it from the Cartesian-European point of view. For example, if we imagine two consecutive sentences, the *ma* between them should be understood as a break or emptiness, but as important as the spoken sentences themselves.

Yamamoto added two further traditional Japanese notions, that of *kokyu* (breath) *and ki* (spirit, soul): He interpreted them on a much broader, intercultural and even biological level and stressed in this context the possibilities of their research and experience through the analogue means of the video technology. [4]

Concerning his video installation *Hand* from 1977, which can be regarded as representative of Yamamoto's work in the 1970s & 80s, he claimed that

"There exists the slightest discrepancy between a certain 'Simple action' and the 'Imitating action' that cannot be discerned by the naked eye [...] This is visual by the electronic video circuit, with only a second's delay. These discrepancies express the degree of mental tension of each moment. Another circuit exists, which is the audience. The difference between the original action and its imitation is perceived as 'MA' (interval), which is sometimes taken as a humorous and sometimes as a spiritual experience." [5]

* * *

In 1970, French philosopher Roland Barthes declared Japan as a model for a kind of system liberated from any (Western) signification-overload, at an important moment in time when art in the West as well as in the East began forming an alliance with technology. Although, or especially because, Barthes had already declared both 'author' and 'subject' dead or moribund, the art of that era happily began to receive new and vital impulses of a technological and intercultural nature.
The emergence of the new medium video then became symptomatically representative of and a contributor to the changes that occurred. Its inherent function as an 'electronic mirror' unfolded, not least through its direct cultural use: it remains a symbol in the West because it is still regarded as subject-loaded and therefore exposed to the reproach of narcissism, whereas the East regards it as a signifier for the emptiness of symbols – 'The spirit of the absolute man is like a mirror,' says Barthes quoting a Taoist master, 'He does not hold onto anything but does not reject anything. He consumes, but does not hold.' [6]
The ability to receive and to give back at the same time, without absorption and without distortion, a Haiku ideal of exposition without comment, and the refusal of any interpretation, can be seen as the paradigm of Zen. The negation of the difference between 'interior' (*uchi*) and 'exterior' (*soto*), and the overcoming of difference 'as such' in immediate or 'simple' presence, also becomes highly enjoyable: According to the interpretation of the Buddhist Mikkyo school, the present, the 'now', is described as the 'ultimate pleasure.'

Iimura

Another good and early example may be seen in the artistic work of Takahiko Iimura (b. 1937). His connection to the *Fluxus*

group and especially to the European and New York structuralist film movement lead Iimura to undertake intensive artistic research on the processes foundational to meaning construction, as demonstrated in his work on the problem of identity (or the subject-object relationship). [7]
Iimura claimed for instance, that the English words *movie*, *motion picture*, or *cinema*, all stress movement; but if we go to Japanese, the word for motion picture is '*eiga*', which literally means 'reflected picture': The emphasis here is on the state of reflection rather than on the motion. Also the Chinese word for cinema, in Iimura's literal character reading, means 'electric shadow picture', so that he supposed that this idea comes from the shadow theatre. Iimura claimed that he himself was also presenting shadow pictures. His Live-Video installations are good examples. Iimuras first Live- or Closed Circuit video installation consisted of a feedback-producing arrangement of a video camera and a juxtaposed monitor: the participant (viewer) sits on a chair in front of a monitor with his back to the camera and is given the task of signing a piece of paper, while saying his or her name out loud. The title of the work consists of the noteworthy statement: *Register Yourself: Unless You Register You Are No Person* (1972), which exemplifies an ambivalent critique of the rules governing the media game.
Iimura combined a comparable ambivalence between the exposure of the participant to media and the denial of the perception simultaneously promised him with the request, *Project Yourself*, in an installation of the same name from 1973: The person sitting on the chair is asked to talk or perform something for one minute. Other visitors are able to look at the person and the live transmission simultaneously; however, the 'performing' person cannot see him- or herself. As in the installation described above, the transmission can be recorded and played back at some point in the future. Iimura presented the structure of picture-viewing, using himself as an object as well as the subject by sitting and facing the screen, having his own audience, and this was particularly suited to the video understood as a reflective medium, for only video has this simultaneous audiovisual response.
With his conceptual approach, Iimura claimed a special position within the first generation of Japanese artists working with electronic media. Especially when considered in relation to the *Gutai* group's ideals of spontaneity, Iimura's art appears to be surprisingly 'Western'. This is ultimately because his art does not conform to the deterministic Western clichés of Japanese artistic thinking. Iimura's work in general reflects, in an unsurpassed way, his cultivated transnational 'postmodernity' at the same time that it radiates the traditional Japanese aesthetic concepts of *wabi* (= simplicity, silence) and *sabi* (= unobtrusive elegance).

* * *

One of the key notions in Japanese aesthetics is *Shibui*, – encompassing, amongst others, readings such as: austere, simple, inconspicuous, dark, tasteful, accomplished, demanding. It expresses some of the important art ideals of the Japanese, the so called *Art Path*, itself strongly influenced by the spiritual and practical background of the Zen-Buddhist theory of the *Art Path* (*geido-ron*). *Geido ron* manifests itself in martial arts, Kabuki or the Tea ceremony and in strong contrast to the Western societies it exists outside of the temple, in the middle of secular life. The theory of the *Art Path* is therefore linked both to the concept of *ma* / Interval (as seen and heard by Yamamoto) as well as to the concept of *Play*, which is sometimes even regarded as the major ideal of the *Art-Path*. [8]

Therefore it is also not surprising, when Keiji Nakamura concludes, that

"It can even be said that rather than approaching reality through the medium, Japanese artists were overwhelmed by the reality of the medium itself [...] that's also because there were extremely few attempts to make direct social or political statements in Japanese video art works, compared to those of other countries." [9]

The Second and the Third Generation

As in the rest of the world, in the years between 1977 and 1989 media art was not yet a standard feature in exhibitions in Japan. However, the 'breakthrough' happened in the background instead - in the form of culminating theories and new insights into electronic media, which together with the commercial introduction and availability of digital computer systems, networks and interfaces, gradually entered into the awareness of a wider general and art audience, aware. It was at the end of that period, in 1989, that the first worldwide exhibition of Interactive art, *Wonderland of Science - Invitation to Interactive Art* (curator: Itsuo Sakane, b. 1930) was opened in Kanagawa in Japan. It was an event which heralded the international

institutional acceptance of this art form and was followed by artistic hyper-production in the field of electronic media.
The combination of digital computer technology with visual interfaces (video cameras, etc.) resulted in a global 'renaissance' of the Live- or Closed Circuit video installation in the 1990s. Besides D. Rokeby, J. Shaw, M. Krueger and others, one participant was the then twenty-seven- year-old Toshio Iwai. He belongs to a long line of international committed media artists with a strategy that Erkki Huhtamo identified as 'an archaeological approach in media art'[10] that began with the experiments with digital versions of nineteenth-century techniques of visual representation (*Flipbook*, *Zoetrope*, *Praxinoscope*, *Thaumatrope* etc.), and progressed via the Chronophotography of E.-J. Marey and sequential photography of E. Muybridge to the computer supported Live-Video Installation.

* * *

Just as in the rest of the world, and in particular, Europe, Japan in the 1990s saw in the context of media art a revival of the artistic preoccupation with the complex topic of the 'subject-object' relationship. 'Narcissistic' video experiments from the 1960s and 1970s, which utilize media as media of self-reflection, have returned in manifold variations with the beginning of the 1990s. Usually they posses an important 'structural' difference: most Live-Video installations were computer aided, and they took advantage of the extended possibilities for the precise manipulation of the visual imagery (as well as of the sound). Instead of the effects generator, the video mixer and the analogue and digital synthesizer, which earlier stood between the input and output device, the digital computer now became the 'controlling device'. Thus, artistic definition and practices have been extended in many cases by components of programming.
In a culture which has not been shaped historically by the Cartesian separation of body and mind of western society, it would seem as hasty to take the treatment of the 'subject' – 'object' relationship for granted with regard to media art as it would in any other field. However, this complex problem has been a tradition in the work of Japanese filmmakers and media artists for decades, constantly recurring as a topic of interest, and makes reference to cultural distinctions and also to the possibility of transgression. At the same time, the Japanese language has no native term for 'Media Art' ('*me de-i a ahto*') or 'Interactive Art' ('*intarakutibu ahto*') and they can not be necessarily subsumed under the traditional notion of Art in the Japanese interpretation. This is because in Japanese linguistic usage the word Art is understood in a wider sense of Life and the World in their multiplex manifestations. This is of course both traditional and '*hyper-modern*', understood as an experiment, an attempt to say something new – just as, in the early days of the *Gutai*-Group, J. Yoshihara ordered to his pupils not to do anything that anybody else would do: an effort to go beyond the commonly accepted boundary of our daily reality, to think and to live in a different way. [12]

Renga & Live-Interaction
The link made between tradition and 'interaction' can be observed particularly well in numerous media installations and media concepts in which the artist's own computer works are compared, for example, with traditional methods of making art:
A pioneer of Japanese media art, Katsuhiro Yamaguchi (b. 1928), was already writing in 1981 in the context of his project *Imaginarium* about its predecessors, above all about 'the traditional collective art form of Japan, such as '*Renku*' or '*Renga*' meetings, i.e. poets' collective improvisations. Especially '*Renku*' meetings were called at private homes on occasion, where emphasis is placed on live communication.[13]
According to the Japanese poet Matsuo Bashō (1644 – 1694), the live atmosphere of the '*Renku*' site is more important than *Haiku*, created from the form of expression of '*Renku*'. He says that, 'when a '*Renku*' meeting is over, sheets of paper as record should be thrown away as rubbish.[14]

The mentioned Keigo Yamamoto referred to the *Renga*-Tradition in describing his own networked and collaborative Live-Media performances or -installations:

'In short, rather than the final piece as a completed work, it is "an art of process" made by a number of pieces and also is an art that reads the "interval" between A and B. In Japan during the Muromachi era (1338–1573), '*Renga*' (linked poem) "a poem read in a game-like way by collaborating" was the trend, where A recites the first half of a poem and B must recite the other half by linking to the first half of it, and

this could be said to have guided network art because it is also an art to read the “interval” between A and B.’[15]

Attracted not least by the ‘interactive’ quality of *Renga*, many Japanese artists have taken up this traditional artistic word game again, also reinterpreting it in their media installations:

Rieko Nakamura and Toshihiro Anzai for example started their project Renga in 1992, connecting the original combined verses to combined images in an approach described as ‘a new methodology of image creation in the digital era. It was given birth at the intersection of art, telecommunication network and multimedia.’[16]

A kind of ‘live distribution of authorship’ also formed part of the Live-Video installation and workshop with the title *Moppet Renga* by Tamio Kihara & Hiroko Otsui at the ICC in Tokyo.in 1996.

Naoko Tosa also related *Interactive Poem,* her Ph.D.-Computer piece, explicitly to the Renga tradition in designating it as ‘Renga-style’[17]

* * *

In the 1990s, media art production in Japan achieved its quantitative as well as qualitative high point. The new generation of the Japanese artists influenced the international media art scene considerably. Their continuous presence at exhibitions and festivals all over the world helped Japanese media art not only to take a leading role in the globalized media art field, but also to give us an idea of the rich historical development of modern art in Japan and its processes of reaching mutual understanding with western art and cultures. It therefore only behoves us to underscore its importance in (Media-) Art History as well – that of the west as much as that of the east.

FOOTNOTES

[1] *gutai-ha* means *Gutai School* or *Group*. The name *gutai* could be also understood as a programmatic allusion, connected to its literal meaning of ‘concrete’, though not understood as ‘real’, but ‘direct’ or ‘spontaneous’, with the skill to convey own thoughts and feelings instantaneously. The second part of the word, *tai*, means ’body’. See Iseki Mas’aki, ‘Geschichtlicher Hintergrund und Entwicklung der Gutai-Gruppe als eine zentrale Frage’ in *Gutai. Japanische Avantgarde / Japanese Avant-Garde 1954 – 1965,* Exhibition Catalogue, ed. Barbara Bertozzi and Klaus Wolbert (Darmstadt 1991) pp. 80-81.

[2] Barbara Bertozzi, ‘Am Ursprung der Neuen Avantgarden: die japanische Künstlervereinigung Gutai’ in *Gutai* (as in note 1), 57.

[3] Hundreds of Live-Video installations are documented in Slavko Kacunko, *Closed Circuit Video Installations. A Contribution to the History and Theory of Media Art* (Berlin 2004; available only in German).

[4] See: Keigo Yamamoto, ‘Winds of the Media from Asia: Human Beings and Art in the B-ISDN Era’ in *Ars Electronica. Facing the Future,* ed. Timothy Druckrey with Ars Electronica (Cambridge / London, 1999).

[5] Cf. note 4. – See also Keigo Yamamoto, text extracted from the catalogue issued at the ‘Toward the Museum of Tomorrow ... Live Art Theater’ exhibition at Hyogo Modern Art Museum (Text: 21/3/1981).

[6] Roland Barthes*Empire of Signs*, transl. Richard Howard (New York: Hill and Wang / Farrar, Straus and Giroux, 1st US ed. 1982), (quote above translated from the German edn, *Das Reich der Zeichen* (Frankfurt / M.: Suhrkamp, 1981), p. 109. (orig: *L’empire des signes*, Geneva: Skira, 1970).

[7] For the related classification of the Live Media Installations see Slavko Kacunko, Closed Circuit Video Installations (see note 3).

[8] See: Hans Belting / L. Haustein, *Das Erbe der Bilder. Kunst und moderne Medien in den Kulturen der Welt* (Munich 1998), in particular the essay by R. Ohashi.

[9] Keiji Nakamura, Introduction in *Private Visions. Japanese Video Art in the 1980s* (Japan Foundation, 1990).

[10] Erkki Huhtamo, 'Time Traveling in the Gallery: An Archeological Approach in Media Art' in Moser / MacLeod (eds.), *Immersed in Technology. Art and virtual Environments* (Cambridge, Ma. / London 1996).

[11] For more information see http://hct.ece.ubc.ca/research/iamascope/.

[12] Hiroshi Yoshioka, 'Embedding Media in Culture' in *Interaction 01* (IAMAS, 2001) p.109.

[13] Katsuhiro Yamaguchi, *Imaginarium* (Exhibition catalogue), Tokyo, February 1981, pp. 20-21.

[14] See note 13.

[15] Yamamoto (as note 4), p. 289. – The Japanese verse form of *Renga* dates back at least eight centuries and is articulated, or practised in collaborative fashion in what one might today call 'real time' and in an occasionally jocular feat of punning between several participants joining together verses of three or two lines. The first three lines later evolved into the haiku (Matsuo Bashō), the Japanese verse form best known in the west.

[16] See: http://www.renga.com/.

[17] Naoko Tosa, *Research on Interactive Characters that Recognize and Generate Emotions in Cyberspace* (PhD thesis), 1999, p. 4. See also: http://www.tosa.media.kyoto-u.ac.jp/.

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“Your number is 96 – please be patient”

Modes of Liveness and Presence Investigated Through the Lens of Interactive Artworks

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ABSTRACT

The notions of liveness and presence are essentially contested concepts, denoting human potentials/ activities as well as system/media properties. Their ambivalence is due to the fact that they are used to emphasize similarities between technological and human interactions as well as to distinguish them from each other. This paper shows how interactive artworks reveal and reflect this contestedness.

It starts from the ambivalent denotations of ‘liveness’ and ‘presence’ to compare their different modes enabled by social and technological systems. If media technologies have led to a discussion of liveness in the performing arts – calling into question a generally accepted concept, they have at the same time enabled a discussion of liveness within the visual arts, bringing into play a concept formerly considered irrelevant.

In interactive art, the performance of the recipient meets the technological performance of the work – in absence of the artist. As will be argued, in addition to the actual human-computer interaction, other forms of liveness are at stake: a ‘symbolic liveness’ situated within the diegetic realm, and a ‘technological liveness’ based on algorithmic processes. The latter again should be distinguished from ‘technological presence’ as pure readiness for interaction.

In addition to setting the theoretical framework, the different modes of liveness and presence will be demonstrated in the form of a live interaction with two exemplary works.

KEYWORDS

interactive art, liveness, presence, contemporaneity

The Liveness of Performances

As is often the case, the notion of ‘liveness’ was introduced to the media context to emphasize a formerly self-evident phenomenon in the moment it became questionable, to distinguish it from the newly emerging practices that challenged it. But – within different contexts – it was used to contrast distinct phenomena, namely the recorded and the mediatized.

Originally, liveness denoted anything “that is in the possession of life (living as opposed to dead)” (OED 1989). It was first related to questions of media in the 1930s, when radio broadcasts made it impossible for the listener to distinguish between the broadcast of sound that was performed in the very moment as opposed to pre-recorded sound. Thus the notion of liveness was introduced as a clarification (Auslander 2008, 58).

If here the live was contrasted to the recorded, recent performance theories contrast it to the mediatized: Erika Fischer-Lichte argues that the co-presence of actor and audience is a necessary condition for the liveness of performances. According to Fischer-Lichte, liveness depends on the ‘autopoietic feedback-loop’ that is characterized by a continuous negotiation of the relation of actor and audience in the course of the performance. As she notes the impossibility of an autopoietic feedback loop within mediatized performances, she does not regard the latter as permitting liveness at all (Fischer-Lichte 2004, 114-126).

We are thus confronted with two different notions of liveness. Though both are based on the idea of the lived experience, the first focuses on concepts of time and relates liveness to simultaneity, whereas the second adds the concept of place and calls for co-attendance as a condition of liveness.

Finally, liveness is given yet another meaning with the increasing importance of interactive media-technologies, as now the ontological status of performer and audience themselves is challenged. As Philip Auslander observes: “The most significant challenge to traditional concepts of presence and interaction between performer and audience now come from digital entities able to perform live and respond both

to other performers and the audience input" (Auslander 2008, 69). Both Auslander and Margaret Morse argue that liveness should not be regarded as a property restricted to humans. Whereas Auslander draws on chatterbots as an example, Morse locates liveness in interactive systems in general, understood as a machine's responsive agency (Auslander 2008, 61f, Morse 1998, 15).

The Presence of Artworks

Due to their objective being and the non-processual nature of works of visual arts, they are conventionally not related to liveness, but to presence, originally defined as "human being there in the moment" (OED 1989). Like liveness, presence was soon also related to the non-human: it was used to denote things that are "ready at hand, immediately accessible or available" (OED 1989). Even works of visual art are therefore considered to feature presence, referring to their material actuality and effect on the visitor. Media philosopher Dieter Mersch goes one step further by defining presence not as physical characteristic, but as ecstasy and constitution, as material affordance (Mersch 2002).

Like liveness, presence is thus more and more related to systemic processes, understood as readiness (for something or somebody) and therefore related to processes of communication. Together with the growing importance of media in communication processes, this leads to a frequent confusion of both terms. However, as will be argued in the following, there is still a fundamental difference between them, which is of great value for the analysis of interactive artworks: whereas liveness is a property (of processes), presence describes a potential (to affect).

Liveness and Presence of Interactive Art

Throughout the 20th century, with the increasing interest of visual artists in processes (of production, reception and material change) and the growing critique of the traditional notion of the work of art understood as a material entity, the boundaries between the visual and the performing arts began to fade. Within this more general development, interactive artworks constitute a unique case. Being based on process and activity forms their performative character, but it is formed by a performance of technical system and audience – in the absence of the artist. They retain the dissociation of artist and work, which is a basic precondition of the visual arts: the distinction between processes of production and contemplation, the basis of the work in a form that has its own objective being – and can thus be preserved – can be considered the distinguishing characteristics of the visual arts, as opposed to other art forms. Interactive art not only constitutes a hybrid between the performative and the visual, it also leads to new interrelations of liveness and presence, which will be analyzed in the following, based on three case studies.

Lynn Hershman: Room of One's Own – Metaphorical Liveness and Technological Presence

Visitors to the Wilhelm Lehmbruck Museum in Duisburg will – at irregular intervals –

notice a cheerful whistling, singing and laughing from one side of the room. Looking for the source of these sounds, they will discover a black box of approximately 30 centimeters edge length, exhibited on a base and therefore at eye level. The front of the box holds a viewing device: a metal cylinder that can be turned by means of a handle. The cylinder has a viewing hole, allowing a glance into the box.

Approaching the box and looking through the cylinder, the visitor sees a dollhouse-like room with a bed, a rug, a chair, a table, a telephone and a TV set. The cheerful utterances stop and at the same time a video projection starts at the back wall of the room: a woman, wearing a red bodysuit, sits on a chair similar to the one in the miniature room, and observes the visitor. A female voice complains: "Excuse me, what are you doing here? How did you get here? Would you please look away?"

Lynn Hershman's 'Room of One's Own' thus has two states of operation, a state of self-sustained attendance (signified by the cheerful utterances), and a state of visitor-induced interaction (starting with the visitor turning the viewing device). Or, to remain within the diegetic realm: a state of contentment and a state of disturbance. Though on the symbolical level, the cheerful utterances don't express any affective invitation at all, technologically we can identify an explicit presence of the system awaiting input. Once the interaction

process starts, we can further observe a systemic liveness constituted by the feedback processes between (technological) system and (human) visitor: if the visitor does not obey the voice requesting to be let alone, a further exploration of the work reveals the complex layers that come with its states of operation. Turning the cylinder not only opens the view into other parts of the room, it also changes the video scenes. One may see the woman undressing and hear further accusations, overhear her phone conversation, watch movie fragments or even observe oneself recorded via a miniature closed circuit video system.

One could argue that the work creates an interactive situation that attempts to simulate face-to-face communication. But Hershman does not aim at an immersive experience of the visitor, nor does she create an illusionist consistency of the three-dimensional miniature room and the video sequences. The coherence of the miniature room and video images is impeded by a constant change of the size and position of the images, of the color scheme (black and white versus color), of cuts (insertion of close-ups and texts), and also through the changing costumes of the protagonist.

Furthermore, there is a complex heterogeneity of the visitor space and diegetic space at stake. Although the visitor may initially have the impression of being addressed personally by the woman, this impression is contradicted in three respects. First of all, the visitor looks through a viewing device into a miniature room; second, the person they see is 'only' projected and not present in the room; and third, the voice they hear does not come from the protagonist (her lips don't move), but is an off-voice (the only sequence that shows the woman talking is one where she does not address the visitor, but talks on the phone). If they investigate where the voice comes from, they will realize that it does not even come from within the box, but from holes on its exterior. The voice can thus be interpreted not as belonging to the diegetic realm of the filmic fiction, but to the artwork as an active entity, which accuses the visitor of disturbing it and asks them to look away. If on the one hand the work thus calls into question a liveness of interaction between the protagonist (the woman) and the visitor, on the other hand it evokes the idea of a liveness of the artwork as such, challenging our role as a recipient of artworks in general.

This interpretation of liveness is based on symbolism, as it personates the artwork as a human-like character. This adds tothe observed systemic liveness constituted by

the technological processes of feedback." The latter can be further described as turn-based liveness, as any process has to be activated by a human recipient. This term is derived from game theorist Jesper Juul, who distinguishes between real-time games and turn-based games: "[the difference] is that in the latter case the game state only changes when the player takes a turn. In a real-time game, not doing anything also has consequences" (Juul 2005, 142).

If Lynn Hershman's work is based on symbolic liveness on the one hand, technological presence and turn-based liveness on the other, the following example focuses on the pretense of presence, while at the same time introducing real-time liveness into the technical system.

Holger Friese, Max Kossatz: Antworten.de – Technological Liveness and Symbolic Presence

"We are serving number 83 – Your number is: 96. Please be patient." The visitor to the early net.art piece 'Antworten.de' encounters a serving system well known from the meat counters of supermarkets or the registration room at the district branch office of city hall. The number is updated continuously – but once a person's assigned number is due, it is skipped and the visitor is assigned a new one.

The visitor, expecting an interactive work of net.art is therefore bound to passivity, the only thing they can do is wait. It is the expectation of feedback that dominates the interaction – if it should even be called that. At the same time, the technological system is very active – it analyses the clock of the computer and reloads the page with a new number every three minutes. The algorithm reloading the numbers and organizing the assignment of a new number to each visitor is quite elaborate.

Accordingly, in this case, the technological system acts independently. Though it has initially noticed the user (assigning him or her a number), it subsequently only feigns to prepare for further exchange. This leads to the question of whether the mere expectation of feedback, the feeling of being registered and the illusion

to be served suffice to create a situation of co-presence and a sense of live-interaction on the side of the visitor.

Whereas Hershman's piece worked with a machinic presence as readiness for user input, Antworten.de only feigns this readiness. On the other hand, it relies on a self-sustained technological liveness, a feedback between the system time, the work's algorithm and files storing the relevant numbers, which can go on for ages without any user input. Therefore, the work presents a machinic real-time liveness, while reducing presence to a symbolic level.

Jonah Brucker-Cohen: BumpList – System Liveness and System Presence

My last example excludes symbolism completely, while relying on machinic and collaborative liveness and presence at the same time: 'BumpList' by Jonah Brucker-Cohen is a mailing list that only allows for six subscribers. As soon as a new subscriber enters the list, the oldest is bumped out, thus the subscribers start a competition for the longest presence in the list. Usually mailing lists are unrestricted, or they serve as a communication medium for a special group that is defined by selection criteria or through editors. 'BumpList', however, is dependent on purely quantitative criteria. The way the participants deal with this fact makes the piece. It challenges a reflection of the existing as opposed to the possible mechanisms of electronic communication. Ironically, a reflective discussion is not possible on the list itself, as people are constantly bumped off. Therefore subscribers started a second, conventional list on the commercial Yahoo platform to discuss 'BumpList' – and of course the artist also joined.

In contrast to 'Room of One's Own' and much more explicitly than 'Antworten.de', 'BumpList' stores recipients' input and is totally dependent on the users' activity. It combines the turn-based mode (updating each time a subscriber is active) with the real-time mode (counting the total time of presence of a subscriber in the system). Even when no user is actively participating, their status changes according to the sheer duration of the existence of the work.

Liveness and Contemporaneity

As stated above, the asynchronicity of production and reception is a key feature of the visual arts, related to the dissociation of an artwork from its author, which means that it can become a historical artefact. As shown, interactive artworks also retain this characteristic, though they feature modes of liveness that are not commonly assigned to traditional works of visual arts. The question now is to what extent the modes of liveness analysed above are bound to the contemporaneity of a work.

While liveness can be understood as a property – and presence as potential – of the here and/or now, contemporaneity relates an entity to its societal context and thereby covers a broader timespan: 'the contemporary' denotes a period within our cultural flow of time. Artworks are characterized as contemporary from the moment of their creation on, as long as the societal and aesthetic contexts they refer to are considered current. As noted, notwithstanding this phase of contemporaneity, works of visual art have generally already aged in the very moment of their first presentation. But this growing interval between production and presentation is taken for granted until the work encounters another threshold: the threshold between the contemporary and the historical – even if it is generally passed unnoticed, as it comes as a slow transition. The artwork slowly loses its connection to our everyday life. The question is: can an artwork bear liveness even if it is considered historical, or is liveness bound to the contemporary?

All three works considered have already reached a certain age: Hershman's installation was created in 1993, 'Antworten.de' in 1997 and 'BumpList' in 2003. In a way we are dealing with historical artefacts, with preserved interaction offers. We thus have to ask whether the societal and aesthetic contexts they relate to are still considered current.

The questions of privacy and voyeurism addressed in Hershman's piece do still have a great societal relevance, so does the reflection of expectations on interactive media as encouraged by 'Antworten.de'. Also the practice of online communication within the Web 2.0 community addressed by Brucker-Cohen is still part of our everyday-life.

But what about the aesthetics, the formal arrangement and the experienced processes? Technically, all three works have undergone a process of alteration or maintenance over the years: Hershman's piece was technically updated in 2005. Whereas the original piece had a back projection for the videos and a touch sensitive mat for sensing the audience, now the videos are shown on the display of an integrated Laptop and the audience's presence is sensed via infrared sensors. According to the artist though, the audience experience remained unchanged. For her, the importance lies in the experienced interaction processes, which required the technical update of the system's liveness, so to speak. Although the dress and hairstyle of the protagonist, for example, might thus seem outdated to us and reveal the historicity of the piece, the processes of interaction establishing the modes of liveness and presence discussed are not affected.

Antworten.de is written in basic HTML code, still widely used today. Therefore the work still runs online in its original version. When I asked Holger Friese for the permission to publish a screenshot, however, he voluntarily agreed, but send me a screenshot of the work shown on an early 1997 Netscape browser, as this was how it originally looked. Though the code has not changed, the browser displaying and framing it has. Thus technologically the work has not aged, it has even undergone rejuvenation due to the updating of the media technologies it relies on. While a 1997 screenshot conveys an idea of the avant-garde-ness of the work as an 'early net.art piece', a recent screenshot does not. Though the work is still online, its historicity is assigned an intrinsic value by the artist, even if it can only be conveyed through recorded screenshots and not through the live work. The system liveness of the work itself is thus unbroken, but due to its embeddedness in commercial systems, it depends on their liveness and therefore has to cope with a concurrence of historicity and contemporaneity.

Jonah Brucker-Cohen's 'BumpList' was online from 2003 to 2004. It was hosted on the server of Media Lab Europe (Dublin), where the artist had a research position. When the institution closed in 2004, the site went offline. It was reinstalled in October 2008 on the occasion of an exhibition at the San Francisco Museum of Modern Art. Though the underlying structure changed (it now runs on a shared server), according to the artist the system is exactly the same. Nevertheless he did not build on the records of 2003/2004, but restarted the list anew. He observes a changed attitude on the part of the subscribers, posting less, which he explains with a better understanding of the mechanism that does not honor the number of postings but the mere time of remaining on the list. Therefore we are confronted with a new and altered version of the project, concerning the stored user inputs, though technically and conceptually it is still the same.

The examples show that the aging of the works may or may not change their aesthetics, but it does not affect their liveness. Even if they are no longer considered contemporary or if they have undergone several processes of restoration or updating, their various modes of liveness and presence remain unchallenged – together with their visual and auditory realization, they actually establish the core of the works as artistic expressions. Therefore, restorations and updates are accepted as inevitable (Antworten.de), necessary (Room of one's own), or reasonable (BumpList) adaptations to preserve their status as work of interactive art.

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BIOGRAPHICAL NOTES

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Early Video Art as Private Performance

Mike Leggett; University of Technology Sydney

Abstract The adoption of video by artists responded to the affordance of immediacy and portability for the making of a motion picture recording. In the early 1970s in England, the potential of this facility was as novel as it was without precedent in the photo-time-based arts and collaborative work between artists generated a range of approaches to working with the new media of the day. This paper draws on two sets of detailed notes the author made in 1973, now held in the British Artistsí Film & Video Study Collection in London and the Rewind archives in Dundee, that record his reflections on the creative potential of the Portapak video recorder and Closed-Circuit Television (CCTV) systems. The making of The Heart Cycle during 1973 commenced as a series of experiments with a roll of 16mm film and a CCTV system, recording a series of procedures and adjustments made to the system during experiments and ërehearsalsí. With references to the work of Donald Schön (1983), contemporary VJ and digital video culture, the paper reappraises the creative process for framing and making the artwork. The conclusions reached at the time about synthesising the videotapeís final form as private performance are explored in the context of contemporary motion pictures and the expanded public contexts for reception. The Heart Cycle has been selected for the Rewind/LUX DVD boxed set, An Anthology of Early British Video Art, 1972-82.

video art, performance, archiving

Introduction

This paper addresses an immediate concern of the Re:live conference by seeking to record a firsthand account of working with electronic media at its early inception. As Simon Biggs has recently observed: ìÖwhilst the subject of intensive historical study, [research] is nevertheless typified by incomplete documentation and hazy recollections of events that were either not documented or which, in their mediality, could not be documented appropriately with the tools of the day.î (Biggs 2009)

The paper draws on two sets of documents on paper, now held in the British Artistsí Film & Video Study Collection in the University of the Arts, London and the Rewind archives at the Visual Research Centre in the University of Dundee. They record my reflections on the creative potential of the Portapak video recorder and a Closed-Circuit Television (CCTV) system, shortly after the technologies became available in the early 1970s to artists and other researchers. Together with case-study notes on the videotape The Heart Cycle (1972), the material will form the basis of a critical reappraisal.

At this time many film and visual artists were averse to the ënon-materialityí of the electronic image and the restricted range of acuity the bandwidth could support. The materiality of the film image was much debated throughout the 1970s, less so the video image. The non-materiality of the video image arises from a perceptual paradigm: light emitted from the video monitor is an asynchronous rendition of electronic information stored on the surface of the videotape. This is in contradistinction to the image on the filmstrip in the gate of the film projector, which is in synchronous relation to the image reflected from the screen. The illusiveness of the material base for the video image became one of the themes of experimental work produced from this point onwards.

A poster, ëVideo + Video/Film ñ Some Possibilities Suggested by Some Experience,í prepared during 1973 and exhibited at the Experimental and Avant-Garde Film Festival at the National Film Theatre in June of that year, recorded the process and outcomes of six exploratory projects pursued during 1971 and 1972 (Leggett 1973). The projects included various CCTV configurations: in 1971 for Ian Breakwellís ONE event at the Angela Flowers Gallery; the Moving Wallpaper in the Television Lounge project at the Somerset College of Art (1972); the Whittingham Hospital performance, The Institution (1971) with Kevin Coyne at Art Spectrum exhibition, Alexandra Palace (Fig 2); and the Artistsí Placement Group (APG) exhibition (1971) at the Hayward Gallery (Leggett 1973/2005).

As performances, the events established their asynchronous materiality through the presence of cameras,

cables, monitors and the general paraphernalia of the CCTV video studio, where the formation of the image and its reception happened in the same physical space. The series was an approach taken in the spirit of what Duncan White identifies as ì..Expanded Cinemaís principle concern with context and the social spaces of receptionî (White 2008).

Practice

Several of my completed films set out to make available to the audience the means, the forms and the materials that constructed the filmic phenomena as experience. In an encounter with ëfilm as phenomenaí, as film ëabstractedí, an opening-up of the spaces between its component parts is created. This is in contradistinction to the narrative conventions of Cinema, intent on concealing the many joins that hold the illusion in place. The problematics of cinema were addressed using this framework through a problem-setting process of a conceptual, substantive (material) and procedural kind. This is in contrast to traditional problem-solving approaches intent on delivering outcomes as product for a market place. My initial approaches to experimenting with video were similar, with the additional aim of developing skills with the new medium and understanding the aesthetic principles emergent from practice.

The outcome of this practise-base was a body of artworks in several media exhibited both nationally and internationally during the 1970s. The focus here will be on one of the video works, The Heart Cycle, for two reasons: firstly it has been curated into the Rewind/Lux DVD, An Anthology of Early British Video Art 1972-1982 (to appear 2009); secondly, a detailed typescript account of the making of the video was ërediscoveredí on the Rewind online database (Leggett 1973). The level of detail in the notes indicates they must have been made soon after the events they record. Some [editing] has been applied to improve syntax, as well as adding explanation and comment on the now obsolete technology and the affordance it provided in the process of making art with Video.

My initial encounters as a filmmaker with the Portapak (Fig 3) were revelatory. I found: ì..on playback, after each attempt, that additions and alterations become quickly apparent.î(Leggett 1973). In the contemporary context this may seem mundane, but in the early 1970s the potential of this facility, as others have noted, was as novel as it was without precedent (Frampton 1974, Marshall 1996, Donebauer 1996, Elwes 1996, Critchley 2006).

The opening sentence of the notes made in July 1973 evoke the spontaneity the technology made possible: ìDriving home with the Portapak in the back ñ stop at the bridge and walk to the stream and set-up tripod in water ñ the idea, the location.î By beginning a process of recording the scene in front of the camera and then determining where this decision would lead, brought the conceptual framework for commencing the making of a motion picture recording into closer proximity than had previously been possible. While these experiments were proceeding, forays into the studio occurred to explore the possibilities of working with CCTV using three studio cameras connected through a vision mixer to the Portapak.

The Heart Cycle: selected annotated notes

ìSet-up the studio to look at some film ñ added another camera to relay off the monitor through mix box; [vision mixer] Öî (Fig 4) The intention was clearly to explore the relationship between the film image and the video image when the film image was used as a source to make a video image using a film projector and video camera. ëTo relay offí the monitor meant that another camera was pointed at the monitor capturing the image coming from the film projector, a ëfeedback loopí connected through the vision mixer.

My first time encounter with the vision mixer required me to understand the various effects selectable by combining knobs, faders and buttons. ì.. became confused by mix box; the temptation being to ëuseí the various effects [and thus] making even simple switching obscure after a while ñ went back to beginning and tried again, forgetting the FX! [effects] î The pre-set effects for combining camera outputs with various graphical shapes tended to ape the effects with which we had become familiar on television. These visual devices ñ wipes, irises, boxes, etc - had evolved from silent cinema traditions; the adjustable matte (Key) effect however, was worthy of further investigation.

“Came to ëfeelí the [vision mixer] box, the mix, superimpose and cutting ñ introduced third camera through Key channel and got to know the box with this very seductive FX ñ finally found the Key image which seemed to work the best, being simple in area and rhythmic in action - this was the film spool on the projector, which after a while was lit with a small spot to improve the outline of the white to black areas. This was controllable using a Key Control knob, such that the area affected by the white key could be altered from zero ñ a blank screen - to maximum, which produced a distorted image of the spool.”

Experimenting with the relation between the object in front of the video camera ñ the film spool turning on the projector ñ and the real-time control of the keyed white and black areas, produced a rhythmic device upon which to build the composition. The feedback loop created with one of the cameras and a monitor, was controlled through the use of the sliding faders on the mixer. The zoom lens (framing) and focus controls on each of the cameras added further variables in the system. During my interaction with each of these control surfaces, a shape and order began to emerge.

“Finally all the elements were combined on the final monitor. The combined images were of great interest, the only problem being where - in terms of start and finish - the [duration of the] combined [images] might exist. A series of takes [recordings] were made onto the P[ortapak] and again played back at the end of each one.”

The facility of the system being developed to show immediate results was quite unlike the experience of making a film, when there is the inevitable delay between exposing the image to film and being able to see the result as a motion picture image. The feedback from the video system encouraged spontaneity similar to making music, drawing, or writing: working with the system was something plastic and responsive.

“The [vision mixer] box proved difficult again but gradually on watching playbacks bits were noticed and technically improved by rehearsing certain box manipulations. Work on [a] short piece [at a time] ñ record then playback. Ö Finally something had sedimented out which needed final structuring - the backend of the film seemed to provide the most sympathetic images. The [use of the] Key was to start the piece with a white line on black; there would be a cut to feedback [from the camera facing the monitor] plus [the] key image [of the rotating film spool, which was] also white on black; then the introduction of the [images from the] film; then the reintroduction of the Key into the image.”

The process of investigating the convergence of these various elements gradually improved not only my skills of interacting with the various control surfaces but also the outcomes delivered as a live composition. The investigative activity shifted away from learning the system to understanding how the different components were determining the shape of the composition and the images it contained. The appearance of the film spool had been abstracted by use of the Key: the rounded shapes of the spool accentuated by the Key giving the visual impression of an electronically generated image, the source of which is not ërevealedí until the very end of the tape - a treated electronic image of a real object”.

The Heart Cycle therefore developed from the manipulation of primary elements contained by the video system, with the images in the emulsion on the acetate of the film occupying a secondary position within the structure. The next question was how to fit the elements of the composition so far constructed into an overall time span.

“It was noticed during one of the final takes that the film spool would speed up imperceptibly as the film came closer and closer to the centre [of the spool]. such that The rate was noticeable frenetic before the film would actually run-off and suddenly stop the spool [rotating] dead. It was decided that this would complete the cycle.”

Problem solved, the duration of the performed procedures with the video system would match the length of the found footage on the projector. The experimental stages had consolidated the procedures to arrive at a series of ërehearsalsí peaking as a final unedited performance, the extent recording of The Heart Cycle.

The recording ended with a coda, where the physical elements of the performance are revealed using a zoom out and track: the spool and the projector, the cameras and monitors, the vision mixer and Portapak,

and then the artist entering left to sit at the mixer and move a fader to take the image to black and the end of the recording.

“Three takes were needed to get the acceptable one Ö the obvious joy was the making of the tape as much as the collision of its various elements. To ëperformí the tape each time was the obvious ideal ñ here anyway was the recording of one of these performances.”

The observation that the ideal would be to ëperformí the procedure ëeach timeí to a live audience was a realisation that the black and white ëlow-bandí video recording delivered with a large television monitor, tended to undermine aesthetic value. Rather than expecting an audience to focus their attention on a television set styled in the domestic taste of the day, what was envisaged was something more expansive. This would share the spontaneity and ëlivenessí of the proceedings with an audience responsive to the presence of the artist and the workís development, a response in part, to the audienceís material presence: incorporation, feedback and looping becoming the key to performance of the workís elements.

Though the Notes presciently anticipate the live performances of contemporary VJs and the dynamic architectures of digital video, analogue video had strict limitations when it came to the live performance involving complex manipulations. Though video experimentation pursued during this greyscale era could expand into gallery spaces as CCTV or prepared tape installations using multiple monitors, the restraints were nonetheless severe compared to film: by the low resolution of the image, lack of colour, imprecise editing options, random interference from poor quality recording tape, etc. When scale, colour and acuity of the image was necessary for a project and if the considerable costs associated with the alternative could be covered, film remained the medium of choice for single and multiple-screen presentation.

It is in the nature of experiments to be unclear about direction and the time needed to pursue them. The approach described here for making art with video is echoed in the work of Donald Schön and his analysis of professional practice, based not on problem solving but problem setting. The artist or researcher makes and tests ì.. new models of the situation Ö to function as transforming moves and exploratory probes.î (Schön 1983) In the case of The Heart Cycle a point was reached in the investigations where the identified elements, emergent from the working procedures, were brought into states of proximity with one another ñ as images, as durations ñ and gradually incorporated into the process of composition, sustained for a finite period. As the series of procedures converge on the durational and physical end point of the film, abstraction seeks to undermine the ëauthorityí of the instructional documentary, creating a durational space through which the dialectic develops between the representation and its antithesis.

Liveness, Performance and Video

The making of The Heart Cycle was a series of live real-time performances, live in the sense of performed iterations proceeding toward the workís final completed duration. The ëtransforming moves and exploratory probesí employed in performing the medium is reflected in the heuristic production of evidence in viewing the completed art work; light as abstract movement, with synchronous/asynchronous sound, as image of place and surface, as image of presence and agency, interrogated within a continuous present. Kacunko describes the performative state as of ì..a kind of highly unstable entity [where] liveness should be regarded as an authenticity guaranteeÖî(Kacunko 2009). This is in the face of traditional archivists (or anyone else for that matter), who regard the recording, (as a storage medium), as the authentic artefact. From ëperforming the mediumí the tendency developed in the following years towards the medium framing performance, and as the technology became more ëfilm-likeí in handling and image appearance, encouraged the use of video for the hermeneutic ends of producing meaning from performance through interpretation. As improvements and upgrades were made to the technology throughout the 1970s ñ colour and general image quality, editing using dual-VCR controllers ñ the affect was to consolidate video being used as ësubstitute televisioní and as others have observed (Spielmann 2008, Rees 1999), as a documentation and documentary tool, using a language made increasingly familiar in the 1980s with the expansion of ëindependentí television production in Britain and throughout the Western world.

The migration process from the analogue version of The Heart Cycle to the digital artefact in 2007, introduced further interruptions and interferences to those already evident: horizontal white lines flick

across the screen, the sign of decay caused by the metallic oxide dropping off the tape mylar substrate ñ ëdrop outí. Within the overall schema of the composition this ëvariableí becomes a manifestation of the rendition of magnetic and electrical fluctuation into digital data, stored on a hard disc or DVD and asynchronously reproduced on replay through microprocessor array onto the screen.

Duration and extreme duration were outcomes of artistsí work with the new media of analogue video, a medium specific for delivering to artists for the first time, motion pictures that displayed in ëreal timeí, the state of a system in synthesis. The Heart Cycle as a record of the synthesis of a performance event, retaining the finite time span of the artistís film, a singular event when replayed on the screen of a video monitor. However, in the act of viewing, it retains in the electronic genesis of the black and white DVD image, a provisional gesture in private performance towards a contemporary present.

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Lifebox Immortality & How We Got There
By Rudy Rucker and Leon Marvell

Abstract A paper in two parts. After a brief introduction from an art historian from the far future, a contemporary (2009) author discusses a near-future exosomatic technology called the lifebox. Unlike the dreams of the "hard" AI project, the idea of the lifebox is not that it will replicate a brain's architecture, but that it will copy a person's memories, preserving the interconnections among them. In this coming technology, a person's memory is viewed as a hyperlinked database of sensations and facts. Memory therefore is structured something like a website, with words, sounds and images combined into a kind of superblog with trillions of links. The lifebox uses hypertextual links to hook together everything one tells it. One's eventual audience will be able to interact with one's stories, interrupting and asking questions. The lifebox will be like a simulation of your self. The reason another person can plausibly expect to emulate another self is that, (a) people are universal computers and (b), people are exquisitely tuned to absorbing inputs in the form of anecdotes and memories. Memories and links can act as a special kind of software that needs to be run on a very specialized kind of hardware: another human being. Essentially one's memories and links are an emulation code. The effect of the lifebox will be to make immortality accessible to a wide range of people. The second part of the paper is in the form of a response to the first part by an art historian from the far future, a time when lifeboxes are ubiquitous. The historian outlines the *ideo-technological* background to contemporary trends set in motion by the lifebox.
Keywords *Lifebox, memory, hypertext, future, immortality*

Introduction

Now that the lifebox is so ubiquitous in these last, fading hours of the 21st century, we thought it opportune to examine how we got here and where the lifebox came from. We begin this short history by presenting an historically important paper via the recollections of *Rudy Rucker's lifebox* — perhaps the most famous and beloved of lifeboxes still in existence — that was originally presented at the *Re:live, the Third International Conference on the Histories of Media Art, Science and Technology* in the early years of the 21st century, in November of 2009 in Melbourne, Australia.

Lifebox Immortality1

By Rudy Rucker

One of the most venerable dreams of science fiction is that people might become immortal by uploading their personalities into some kind of lasting storage. Once your personality is out of your body in a portable format, it could perhaps be copied onto a fresh tank-grown blank human body, onto a humanoid robot or, what the heck, onto a pelican with an amplified brain. Preserve your software, the rest is meat!

In practice, copying a brain would be very hard, for the brain isn't in digital form. The brain's information is stored in the geometry of its axons, dendrites and synapses, in the ongoing biochemical balances of its chemicals, and in the fleeting flow of its electrical currents. In my early cyberpunk novel *Software*, I wrote about some robots who specialized in extracting people's personality software by eating their brains. When one of my characters hears about the repellent process, "[His] tongue twitched, trying to flick away the imagined taste of the brain tissue, tingly with firing neurons, tart with transmitter chemicals."2

In this paper I'm going to talk about a much weaker form of copying a personality. Rather than trying to exactly replicate a brain's architecture, it might be interesting enough to simply copy all of a person's memories, preserving the interconnections among them.

We can view a person's memory as a hyperlinked database of sensations and facts. The memory is structured something like a website, with words, sounds and images combined into a superblog with trillions of links.

I don't think it will be too many more years until we see a consumer product that makes it easy for a person

to make a usable copy of their memory. This product is what I call a lifebox.3

My idea is that your lifebox will prompt you to tell it stories, and it will have enough low-level language recognition software to be able to organize your anecdotes and to ask you follow-up questions. As you continue working with your lifebox, it builds up a database of the facts you know and the tales you spin, along with links among them. Some of the links are explicitly made by you, others will be inferred by the lifebox software on the basis of your flow of conversation, and still other links are automatically generated by looking for matching words.

And then what?

Your lifebox will have a kind of browser software with a search engine capable of returning reasonable links into your database when prompted by spoken or written questions from other users. These might be friends, lovers or business partners checking you out, or perhaps grandchildren wanting to know what you were like. Your lifebox will give other people a reasonably good impression of having a conversation with you. Their questions are combed for trigger words to access the lifebox information. A lifebox doesn't pretend to be an intelligent program; we don't expect it to reason about problems proposed to it. A lifebox is really just some compact digital memory with a little extra software. Creating these devices really shouldn't be too hard and is already, I'd say, within the realm of possibility it's already common for pocket-sized devices to carry gigabytes of memory, and the terabytes won't be long in coming.

I discussed the lifebox at some length in my Y2K work of futurology, *Saucer Wisdom* 4, a book in the form of a novel, framed in terms of a character named Frank Shook who has a series of glimpses into the future thanks to some friendly time-traveling aliens who take him on a tour in their tiny flying saucer. (And, no, I'm not a UFO true believer, I just happen to think they're cute and enjoyably archetypal.)

The lifebox is a little black plastic thing the size of a cell phone and it comes with a light-weight headset with a pinhead microphone. You can use your lifebox to create your life story, to make something to leave for your children and grandchildren. My character Frank watches an old man using a lifebox. His name is Ned. White-haired Ned is pacing in his small back yard — a concrete slab with some beds of roses — he's talking and gesturing, wearing the headset and with the lifebox in his shirt pocket. The lifebox speaks to him in a woman's pleasant voice.

The marketing idea behind the lifebox is that old duffers always want to write down their life story, and 3 with a lifebox they don't have to write, they can get by with just talking. The lifebox software is smart enough to organize the material into a shapely whole. Like an automatic ghost-writer.

The hard thing about creating your life story is that your recollections aren't linear; they're a tangled banyan tree of branches that split and merge. The lifebox uses hypertext links to hook together everything you tell it. Then your eventual audience can interact with your stories, interrupting and asking questions. The lifebox is almost like a simulation of you.

To continue his observations, Frank and his friends skip forward in time until past when Ned has died and watch two of Ned's grandchildren play with one of the lifebox copies he left behind.

"Frank watches Ned's grandchildren: little Billy and big Sis. The kids call the lifebox "Grandpa," but they're mocking it too. They're not putting on the polite faces that kids usually show to grown-ups. Billy asks the Grandpa-lifebox about his first car, and the lifebox starts talking about an electric-powered Honda and then it mentions something about using the car for dates. Sis — little Billy calls her "pig Sis" instead of "big Sis" — asks the lifebox about the first girl Grandpa dated, and Grandpa goes off on that for awhile, and then Sis looks around to make sure Mom's not in earshot. The coast is clear so she asks some naughty questions about Grandpa's dates. Shrieks of laughter. "You're a little too young to hear about that stuff," says the Grandpa-lifebox calmly. "Let me tell you some more about the car."

My character Frank skips a little further into the future, and he finds that lifeboxes have become a huge industry. People of all ages are using lifeboxes as a way of introducing themselves to each other. Sort of like home pages. They call the lifebox database a *context*, as in, "I'll send you a link to my *context*." Not that most people really want to spend the time it takes to explicitly access very much of another person's full context. But having the context handy makes conversation much easier. In particular, it's now finally possible for software agents to understand the content of human speech — provided that the software has access to the speakers' contexts.

Coming back to the idea of saving off your entire personality that I was initially discussing, there is a sense in which saving only your memories is perhaps enough, as long as enough links among your memories are included. The links are important because they constitute your *sensibility*, that is, your characteristic way of jumping from one thought to the next.

On their own, your memories and links aren't enough to generate an emulation of you. But if *another person* studies your memories and links, that other person can get into your customary frame of mind, at least for a short period of time. The reason another person can plausibly expect to emulate you is that, first of all, people are universal computers and, second of all, people are exquisitely tuned to absorbing inputs in the form of anecdotes and memories. Your memories and links can act as a special kind of software that needs to be run on a very specialized kind of hardware: another human being. Putting it a bit differently, your memories and links are an emulation code.

Certainly exchanging memories and links is more pleasant than having one's brain microtomed and chemically analyzed, as in my novel *Software*.

I sometimes study an author's writings or an artist's works so intensely that I begin to at least imagine that I can think like them. I even have a special word I made up for this kind of emulation; I call it *twinking*. To twink someone is to simulate them internally. Putting it in an older style of language, to 4 twink someone is to let their spirit briefly inhabit you. A twinker is, if you will, like a spiritualistic medium channeling a personality.

Over the years I've twinked my favorite writers, scientists, musicians and artists: Robert Sheckley, Jack Kerouac, William Burroughs, Thomas Pynchon, Frank Zappa, Kurt Gödel, Georg Cantor, Jorge Luis Borges, Edgar Allan Poe, Joey Ramone, Phil Dick, Peter Bruegel, etc. The immortality of the great ones results from faithful twinking by their aficionados.

Even without the lifebox, if someone doesn't happen to be an author, they can make themselves twinkable simply by appearing in films. Thomas Pynchon captures this idea in a passage imagining the state of mind of the 1930s bank-robber John Dillinger right before he was gunned down by federal agents outside the Biograph movie theater in Chicago, having just seen *Manhattan Melodrama* starring Clark Gable.

"John Dillinger, at the end, found a few seconds' strange mercy in the movie images that hadn't quite yet faded from his eyeballs Clark Gable going off unregenerate to fry in the chair, voices gentle out of the deathrow steel *so long, Blackie* ... there was still for the doomed man some shift of personality in effect the way you've felt for a little while afterward in the real muscles of your face and voice, that you were Gable, the ironic eyebrows, the proud, shining, snakelike head to help Dillinger through the bushwhacking, and a little easier into death". 5

The effect of the lifebox would be to make such immortality accessible to a wider range of people. Most of us aren't going to appear in any movies, and even writing a book is quite hard. Again, a key difficulty in writing any kind of book is that you somehow have to flatten the great branching fractal of your thoughts into a long line of words. Writing means converting a hypertext structure into a sequential row it can be hard even to know where to begin.

As I've been saying, my expectation is that in not too many years, great numbers of people will be able to preserve their software by means of the lifebox. In a rudimentary kind of way, the lifebox concept is already being implemented as blogs. People post journal notes and snapshots of themselves, and if you follow a blog closely enough you can indeed get a feeling of identification with the blogger. And many blogs already come with search engines that automatically provide some links. Recently the cell-phone company Nokia started marketing a system called *Lifeblog*, whereby a person can link and record their daily activities by using a camera-equipped cell phone.

Like any other form of creative endeavor, filling up one's lifebox will involve dedication and a fair amount of time, and not everyone will feel like doing it. And some people are tongue-tied or inhibited enough to have trouble telling stories about themselves. Certainly a lifebox can include some therapistlike routines for encouraging its more recalcitrant users to talk. But lifeboxes won't work for everyone. What about some science fictional instant personality scanner, a superscanner that you wave across your skull and thereby get a copy of your whole personality with no effort at all? Or, lacking that, how about a slicer-dicer that purees your brain right after you die and extracts your personality like the brain-eaters of *Software*? I'm not at all sure that this kind of technology will ever exist. In the end, the synaptic structures and biochemical reactions of a living brain may prove too delicate to capture from the outside.

I like the idea of a lifebox, and I have vague plans to try and make one for myself. I envision a large database with all my books, all my journals, and a connective guide/memoir □ with the whole thing annotated and hyperlinked. And I might as well throw in some photographs □ I've taken thousands over the years. And it should be feasible to endow my lifebox with enough interactive abilities; people could ask it questions and have it answer with appropriate links and words. My finished lifebox might take the form of a website, although then there'd be the thorny question of how to get any recompense for the effort involved. A commercial alternative would be to market it as a set of files on a portable data storage device of some kind. *Rudy's Lifebox* □ my personal pyramid of Cheops.

But I don't really think the lifebox would be a living copy of me. Without some radically more powerful software, it would just be another work of art, not so different from a bookshelf of collected works or, more accurately, like a searchable blog.

So how would you go about creating a human-like intelligence? That is, how would you animate a lifebox so as to have an artificial version of yourself?

A short answer is that, given that our brains have acquired their inherent structures by the process of evolution, the likeliest method for creating intelligent software is via a simulated process of evolution within the virtual world of a computer. There is, however, a difficulty with simulated evolution — even with the best computers imaginable, it may take an exceedingly long time to bear fruit.

An alternate hope is that there may yet be some fairly simple model of the working of human consciousness which we can model and implement in the coming decades.

In any case, even without an intelligent spark, a lifebox can be exceedingly lifelike.

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& How We Got There
By Leon Marvell

The mind is a fractal hypertext and the self is a looping recursion within this hypertext. Can we even trace who originally said this? In a world composed almost entirely of data-noise, the sources of innovation have become inconsequential and our innovators appear as mere specters haunting the edges of our collective

dreams. The notion of the self as a looping recursion within a hypertext-society-of-mind is so pervasive in contemporary society that it is almost a cliché, yet it is the aim of this presentation to trace the connexions between this idea and the lifebox — to unearth the hypertextual pattern within the ideo-technological network that gave rise to the lifebox.

Only a few years before Rudy Rucker delivered the preceding paper, another writer of speculative fiction, Robert J. Sawyer, had written a novel called *Mindscan* 6 in which, inspired by the speculations of Ray Kurzweil's *The Age of Spiritual Machines* (1999), he envisioned individuals being able to upload their psyches into artificially produced bodies: "[T]he locations, interconnections, and contents of all the somas, axons, dendrites, pre-synaptic vesicles, neurotransmitter concentrations, and other neural components and levels" would be exactly replicated such that the "entire organisation can then be re-created on a neural computer of sufficient capacity, including the contents of its memory"7 In the 6 process imagined by Sawyer a quantum fog is injected into the skull of the person wishing to be replicated. An instantaneous "snap-shot" of the psyche is captured in the artificial body's braincase, also permeated with quantum fog, owing to the phenomenon of quantum entanglement. In Sawyer's time mathematician Roland Penrose and medical scientist Stuart Hameroff were proposing that consciousness was an effect of the macroscopic, coherent superposition of quantum states in microtubules within the cerebrum. In effect, the human brain operated as a massively parallel quantum computer and consciousness was a particular outcome of quantum wave-state collapse. It is highly probable that these speculations were the secondary inspiration behind Sawyer's vision of the transfer of consciousness being effected through the exploitation of the quantum entanglement phenomenon.

While Penrose and Hameroff's theory was considered both highly theoretical and rather eccentric in the late 20th and very early 21st century, the furious progression of technological prostheses in the 21st century has at least confirmed the utility of these speculations. We now live in an era in which biocomputers utilising Penrose-Kurtzweil architecture capable of zettabyte-and-beyond memory are networked across the globe, and those enabled with enough G8 Kredits can upload, modify and maintain their lifeboxes in what amounts to a virtual perpetuity.

Yet despite the success of the Penrose-Kurtzweil architecture, Rucker was certainly prescient in arguing that, "In the end, the synaptic structures and biochemical reactions of a living brain may prove too delicate to capture from the outside." The No-Cloning Theorem was proven correct in the middle of this century and the disastrous consequences of those wayward experiments are so well known, so notorious, that we shall not entertain further consideration of them here.

In the last century no artificial versions of selves have been produced such that they are indistinguishable from the antecedent version (as Sawyer and Rucker had imagined), but it is certainly the case that lifeboxes are now possessed of powerful emulation software — more powerful than Rucker could have imagined in the early 21st century — operating within the wetware carapaces of these ubiquitous portable devices. This emulation software is powerful enough to enable networked lifeboxes to create their own communities of complex hive-minds and to undertake the direction of low-level societal computing and urban design, as is well known.

Rather than dwelling on the obvious, in this presentation I want to draw attention to the ideotechnological history that underpins the present functioning of the lifebox within contemporary society: for here Rucker's notion that a lifebox without "some radically more powerful software…would just be another work of art…" has proven to be not quite so prescient. The radically more powerful software indeed came into being, with the result that the lifebox has become perhaps the ultimate artistic technology. We now live in an era in which everybody is indeed getting their 15 minutes worth, and Lifebox-Dandyism has been the fad for over a decade, totally supplanting early forms of social networking software and becoming the pre-eminent form of non-proximal mediated communication.

The ideo-technological history I will be tracing is inspired by two notions explored in Rucker's paper:

twinking and the fractal branching structure of the human mind.

Rucker's concluding remark that "even without an intelligent spark, a lifebox can be exceedingly lifelike" captures the spirit of the succeeding years of lifebox development and also gestures towards the less obvious history of lifelike technologies. Historical records show that in the mid-1960s a computer program called ELIZA was designed to run a natural language processing emulation called DOCTOR. This was one of the first instances of so-called expert systems, in this case a comparatively simple example of pattern matching software. Despite the primitiveness of the software the program 7 was so successful in its simulation of a specific human interaction scenario, that of a doctor (the computer) and a patient (the software's interlocutor), that it fooled many people into thinking that they were interacting in a virtual consulting room with an actual doctor. Simply put, many people were convinced that the computer possessed the "spark of intelligence" that Rucker speaks of.

When individuals were told that the lifelike impression of ELIZA was an illusion produced by emulation software, many desperate patients refused to believe it, thinking that there must have been a cognizing human being hidden within the interaction, not a lifeless program run on a computer. Others smugly opined that the program was the perfect example of how a computer could never be programmed with human-like intelligence, as it merely parroted human speech patterns. Both of these responses derive from a belief that there is something *quintessentially* human that no silicon-based machine could ever successfully emulate or reproduce: that which the ancient philosopher Descartes called the *cogito*, the conscious self, itself a sign of a spiritual substance, the 'soul', that made humans unique.

The progressive refinements of computing technology behind the development of the lifebox — specifically the development of bio-circuitry and the consequent enabling of quantum computation at the micro-cellular level — has led us to reject the idea of this quintessence and consequently reify the notion that, contrary to the Cartesian viewpoint, the mind is a fractal hypertext and the self is a looping recursion within this hypertext. Two "outsider" hypertextual *contexts* of the late 20th, early 21st century will to be invoked here to further my enquiry into the history of the lifebox: Theodore (Ted) Nelson and Douglas Hofstadter.

In 1965 Ted Nelson in the *Proc. 20th Nat. Conf. Assoc. Computing Machinery* stated, "Let me introduce the word 'hypertext' to mean a body of written or pictorial material interconnected in such a complex way that it could not conveniently be presented or represented on paper." Two events inspired this idea: his reading of Vannevar Bush's article from the *Atlantic Monthly* first published in 1945, *As We May Think,* in which Bush conceived of an artificial device that would connect associative trails between texts for archival purposes, and his reading of Samuel Taylor Coleridge's poem *Xanadu* wherein he discovered the image of a huge storehouse of memories in the form of Kublai Khan's Pleasure Dome. These twin encounters can be seen as the initiatory factors behind of his life's work.

Nelson's conception of the hypertextual was of a system of non-linear, non-synchronic inscription that allowed one to constellate meanings in localized, open clusters, following one's own associative trails rather than passively allowing those imposed by the source documents. Nelson invented a neologism for this process that would illuminate the interconnectedness of ideas, a word that revealed the relations between science, music, literature, visual arts and the moving image. For Ted Nelson everything was (and is) "deeply intertwingled."

Following his initial insight, in the late 1960s Nelson spent time at Brown University in Providence, Rhode Island, helping to build a hypertext system. By the early years of the 21st century however he had come to regret that formative involvement:

"That project dumbed down hypertext to one-way, embedded, non-overlapping links. Its broken and deficient model of hypertext became by turns the structure of the NoteCards and HyperCard programs, the World Wide Web, and XML".8

Nelson realised that primitive systems such as the World Wide Web and XML coding were instances of striated data patterns that served only to support the Commissars' reassertion of their hegemony.

Of XML coding in particular he noted,
"It gratuitously imposes hierarchy and sequence wherever it can, and is very poor at representing overlap, parallel cross-connection, and other vital non-hierarchical media structures that some people do not wish to recognise. I believe humanity went down the wrong path because of that project at Brown".9

His life-long project *Xanadu* was to be a global electronic dissemination system that would have created a vast, labyrinthine library available for all to access — a virtual Library of Alexandria, but without the Pharaoh's flunkies baring your entrance if you were not of the learned elite. In the early years of the 21st century this project eventually morphed into Xanadu® SpaceTM, an attempt to sculpt data streams in a graphical space of three virtual dimensions. Nelson imagined that this would become the *sine qua non* of the virtual social networking spaces that had begun to emerge in and around the year 2003:

"Envision social networking done this way: imagine your personal profile as a flying document in space, with thousands of connections streaming off in all directions, where you can spin various wheels or whatever to zoom in and have different parts of the network light up or disappear".10

In this new hypertextual space one's personal flying profile would take the form of a "live document", yet it would be a document unlike any document that had preceded Nelson's conception: "My style of hypertext would allow you to create your own mesh of insightful structures in a live document, as you explore. A document is not a file and nor is it necessarily a sequence. It is a structure".11 Here one is reminded of the sage advice of another writer of speculative fiction from the period we are discussing, William Gibson. He once famously said that if one wanted to write science fiction, then one should write about the next 15 minutes. Metaphorically speaking, the distance between Nelson's dream of a living, hypertextual document that was a constantly metamorphosizing personal profile is only 15 minutes away from Ruckers's conception of the lifebox. The "document" Nelson imagined became the lifebox of today: not a file, not a directory (the very word 'directory' would no doubt have made Nelson reach for his revolver12) nor even a sequence in time, but rather a spatialised structure that we now popularly refer to as a "context" after the popular dissemination of Rucker's terminology in about the middle of this century.

If there is one single key to unlocking the ideo-technological history I am discussing, then it is this: Nelson's use of the word "structure". For expedience I will deliberately conflate this term with the word "pattern" while simultaneously recalling the words of the *pater familias* of cybernetic theory, Norbert Wiener, "We are not stuff that abides, but patterns that perpetuate themselves".13

We now know that the 'stuff' mentioned by Wiener — that is, the classical conception of matter — is in actuality a pattern with an event structure. Rocks too are recursive events, it is just that they are very slow events. And while it is now generally conceded that selves are evanescent looping recursions within a fractal hypertextual space, this was not always the case.

As far as one can ascertain, the proximal hypertext for these notions is Douglas Hofstadter. In the early 21st century Hofstadter conceived the idea that the self is a recursive loop, a strange loop, as he called 9 it.14 To provide a picture of what he intended by this, he often said that a self is rather like a smile. A smile isn't a thing, it's not composed of 'stuff', it's a pattern. He formulated his idea somewhat like a Zen koan:

"So what is this thing called a smile? …A smile persists for a while, and then vanishes. Where is your smile when it's not on your face? It's a potential. [It's] a pattern — like a whirlpool or a tornado".15

Furthermore a smile "can exist in different media, on different substrates if you prefer. I see it in the mirror, in photographs. And, again, a bit of it is on my children's faces if they happen to be smiling. So if someone asks: "Your smile yesterday and your smile today: which one is the 'real' smile?" I'd reply: neither, both are

genuine, my smile comes in multiple instances."16

The recursive instances that we call the self are reflexive, fractal patterns that include an image of them selves. It is this self-image that is the key to Hofstadter's phrase "strange loop". Strange loops occur when, traversing any hierarchical system, one eventually discovers that one is back at the beginning again. Selves are thus irreducibly self-reflexive, paradoxical, and ironical—in a funny kind of way, of course.17

By insisting that a self, like a human smile, is a recursive event pattern, Hofstadter sought to "get across that "I" can exist in multiple spots in the world, that it can flicker in and out of existence the way a smile can."18 Even so, "A person's smile changes over a lifetime, from childhood to old age. Yet people may say: "I still see the same smile I could see 50 years ago."19

If we consider the foregoing in light of what one might call the 'translation problem' raised by Rucker in his early paper on the lifebox presented here, Hofstadter provides another angle that allows us to see how the problem was eventually solved. He proposes that when a novel is translated from one language to another, nobody gets really upset and yells that the translation is a lie — despite the fact that not a single word of the original language remains. He notes that this is because a novel is not only a sequence of words, it is a complex pattern comprised of characters, events, places, cultures and literary style:

"And one essential in preserving its identity across media or languages, in deciding whether a translation really is *Eugene Onegin*, for example, is the "grain size", the resolution. A summary isn't a novel, it's too coarse".20

Thus we can see how the translation problem was early connected to the resolution problem. Now that we are familiar with the notion that selves are a form of emulation code — now that we are living in an actual world that was at one time only a fictional world inhabited by Frank Shook and his friends — we recognize that we are all high-order twinkers who daily utilize a comparatively low-order twinker, the lifebox. Yet with each successive iteration of the wetware we have seen the *context* thus produced become more and more lifelike, so much so that many of the cognoscenti amongst the Lifebox-Dandy set often participate in events solely through the agency of their lifebox or even relegate the task of producing artworks to their devices. The finer the grain-size, the more lifelike the lifebox has become.

As our century as progressed it has become clear that there is a catastrophe point beyond which the emulation of a self cannot proceed, a level of resolution that is seemingly impossible to achieve. What is this mysterious point? We know that the wave-state collapse represents this point, but why the wave state-collapse in the first place? No doubt we might never know the answer to this question, and perhaps it is nonsensical in the first place. One might conclude however that at this juncture the lifebox may have to doff its hat to the masters of old, to the painters and sculptors and multimedia artists of the 10 centuries before and including the early years of our own.

For when we stand before the dendritical paintings of Jackson Pollock, the chaotic surfaces reflecting the microtomed sections of his brain, the chance neural firings of feet, heart, blood, hands and brush are there forever etched into the matter of the canvas, and no matter at which resolution we set our forensic micrometers, we will always see the being of Pollock ahead of us, travelling perhaps into infinity.

NOTES

1 This material is adapted from a section of Rudy Rucker, *The Lifebox, the Seashell and the Soul*, Thunders Mouth Press, New York, 1995.

2 Rudy Rucker, *Software*, (Ace Books, New York 1982), p. 36. In quantum information theory there's a quite different kind of discussion concerning whether it would be possible to precisely copy any physical system such as a brain. The so-called No-Cloning Theorem indicates that you can't precisely replicate a system's quantum state without destroying the system. If you had a quantum-state replicator,

you'd need to destroy a brain in order to get a quantum-precise copy of it. This said, it's quite possible that you could create a behaviorally identical copy of a brain without having to actually copy *all* of the quantum states involved.
3 I first used the word in a short story, "Soft Death" (*The Magazine of Fantasy and Science Fiction*, September, 1986).
4 *Saucer Wisdom*, (Tor Books, 1999) pp. 57 - 59.
5 Thomas Pynchon, Gravity's Rainbow, (Viking Press, New York 1973) p. 516.
6 Sawyer, Robert J. *Mindscan* NY, Tor, 2005
7 Sawyer, Robert J. *Mindscan* NY, Tor, 2005, page 43
8 "Lost in hyperspace", *New Scientist* magazine, issue 2561, 22 July 2006, page 26
9 ibid.
10 "Living online: The internet could be so much better", *New Scientist* magazine, issue 2569, 16 September 2006, page 55.
11 *New Scientist* magazine, issue 2569, 16 September 2006, page 55.
12 We are not really sure what the antique term 'revolver' actually means; yet we find the locution quaint and perhaps of historical interest.
13 Wiener, Norbert. *The Human Use of Human Beings* NY: Avon Books, 1967, page 130.
14 Hofstadter, Douglas. *I am a Strange Loop*, Basic Books, 2007.
15 "In the end, we are all part of one another*", New Scientist* magazine, issue 2594, 10 March 2007, page 46-48.
16 ibid.
17 A far as I can tell, and according to Hofstadter's memoirs.
18 "In the end, we are all part of one another*", New Scientist* magazine, issue 2594, 10 March 2007, page 46-48.
19 ibid
20 ibid

Executable Cinema:

demos, screensavers and videogames as audiovisual formats

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Abstract

The digitisation of the multilayered cinematographic apparatus turns the cinematographic image into an extension of the projecting system, making the movie impossible to be separated from the rendering mechanism in both physical and logical levels. Thus, graphic user interfaces and digitised movies would share a similar nature, in which every image is a real time manifestation of the computer as a surface effect. So, the definition of the limits between the audiovisual work and the rendering system becomes somewhat arbitrary, conditioned by economical and cultural standards that are not directly related to the qualities of cinema itself. In order to further investigate this hypothesis, we analyze three different computer-generated visual systems as audiovisual "genres": *demoscene* videos, screensavers and videogames.

Introduction

The intrusion of digital technologies in audiovisual circuits does not only promote the reform of the filmmaking procedures, but also modifies the very nature of the technical image. In this new configuration, audiovisual objects are no longer reproduced by playback, but interpreted through rendering, only existing in the circumstance and quality of its exhibition. The image is how the interaction of different mechanisms appears on the screen – just like in an abacus the movement of the pieces does not constitute the graphic representation of calculus, but is calculus itself.

Therefore, a digital movie should not be considered as a surface *projected from* a dispositif, but the *pure dispositif* – or, more precisely, one of its bare faces, which is accessible to *spectators*. If its exhibition retrieves any latent, perhaps pro-filmic, meaning, it is in an almost arbitrary way. A priori, it is just the manifestation of a system in process. As the system runs, the screen refreshes; frames are composed; a narrative unfurls.

Thus, it should become clear that there exists no dichotomy between the digital a paratus and filmworks. Hardware and software only operate synergistically and, under the logics of the computer, both the movie file and the media player software are composed by the same binary patterns, organized through different levels of abstraction – all of which "are simultaneously erased at the moment in which the computer actually generates an image" (Bolter and Grusin 1999, 27).

For an aesthetics of compression

However, if we had to decide on a separation between apparatuses and media objects – between the medium underpinnings and its language –, we could say that *codecs* are what define the limits of cinematographic practice within digital systems. These industrial standards establish how audiovisual information is codified in binary data. Without them, the reproduction of a movie in an informational system would always depend of the algorithms for rendering to be included in the work structure. The movie file, just like ordinary software, would have to be executed in a lower (less abstract) level of computation.

One of the main reasons of such technology is economic. Pairing up efficient data compression with a common rendering grammar, codecs reduce drastically the size of a movie file, making possible its distribution through digital means. For instance, it is just because of MPEG-2 codec that DVDs are a viable format for the distribution, storage and reproduction of movies. This codec reduce in 97% the amount of data needed for moving image information, so that a feature film can fit in one versatile disc of 4,7 gigabytes without any significant loss of quality (Lasica 2005, 88). Moreover, the standardization of rendering procedures allows the same set of audiovisual data to be equally reproduced in the most different devices. Such portability is not possible to conventional software, which must be compiled in accordance to the architecture of each system (Murray 2003, 82). For those reasons, some might argue that the biggest responsible for the recent changes in the entertainment industry are not the peer-to-peer file sharing

networks, but the increasing sophistication of codecs (such as the iconic Mp3 format) (Lasica 2005, 89).

However, at the same time codecs foment market revolutions, they also define the boundaries of digital cinema. The preponderant reason for standardizing sound and image is pragmatic. The uniformity of rendering routines assures the absolute universality of the available operations: in the same media player – in the same editing software –, different files can be loaded, just like film reels in a projector. This allows for a common architecture for the whole circuit, over which filmworks can be produced and consumed in accordance to the historically constituted paradigms of the cinematographic institution. The moviemaker does not need to understand how the codification of data occurs; he is free to produce cinema as he has always done, employing software whose interface simulates established routines of film production. Her work ends where the codecs' starts: packing and unpacking data bits in complex signifying arrangements.

Thus, codecs organize the medium as a territory: on the one side, the apparatus, the normal infrastructure of production and consumption; on the other, the available field for cinematographic creation. Of course, such division is entirely arbitrary, and even sterile, since it insists in this historical separation digital media rends obsolete. What the standards really define is how information processes employ the materiality of the system – i.e., the amount of memory necessary for storage and reproduction of movies, the way pixels are organized in the screen, etc. This is a dimension of the medium that does not allow simulations; parameters that correspond to the very quality of *time* in the digital image. Should not cinematographic creation involve such elements in a more critical way?

Spectacular interfaces

There even exist some initiatives that question commercial aspects of media codification. One example is the *Ogg* format, a collection of open source codec developed by the Xiph.Org Foundation. Even so, few projects consider the formal dimension of codecs. Among those, one of the most instigating ones is *Download Finished,* an online system that scrambles and republishes "footage" found in p2p networks Download Finished operates precisely in the stage of data decodification, "which translates the underlying data structure of the films onto the surface of the screen".

Going through this "transformation machine", conventional movies become amorphous masses of confused pixels, whose insufficient proximity to figurative image reveals the arbitrarity of rendering routines. However, in this situation, we once again have a fixed apparatus to which different works can be coupled, without the need of a poetic correspondence between both levels. Hence, even thought it makes critical use of codecs, Download Finished still respects its essential operation and the modularity they favour.

It is indeed difficult to find a cinema in which those stratums of production are combined in an expressive way. Whenever this happens, the resulting work not rarely belongs to another field. As it employs the processual character of digital media, a work becomes subject to different interferences and interpretation. Normally, such possibilities preside over its form and operation – just like in videogames, for example. These images exist not to be *seen*, but *operated*.

However, that is not what interests us here. In fact, we are trying to define up to which point interactive screens can be object of mere *spectation* – the involuntary and dysfunctional attention that is particular to the cinematographic medium (Munsterberg: 28). After all, spectation never emerges from the work. It is a stance of the user, a *modus operandi* that can be adopted in relation to anything. It is the spectator who decides what is worth to be seen and, doing so, defines *cinema*.

In informatics, most of the times, spectation is but a measure for the agency of the system. According to Janet Murray, agency is "the fulfilling capacity of performing meaningful actions and seeing the results of our decisions and choices" (Murray 2003, 127). Thus the gaze is specialized and takes part in the dispositif. The operator is so immerse in the image that it becomes difficult to watch it: the *optical* dimension only matters while subjected to the *haptical* one, or so it seems. The *screen* only exists in function of the mouse, of the joysticks, of the keyboard. The image only exists so that the traffic of data is possible. It is a channel of input and output: image-interface.

But when we take some distance from the system, a surface becomes evident. As the user is excused *and control leaves its reach*, all that he can do is to observe: a fourth wall naturally appears.

That to which the system nothing demands tends to become *audience*. A system produces audiences precisely where it turns out to be autonomous (and therefore closes itself). In that situation, the system becomes an image, but does not reveal its operation. Most of the times, what happens is the contrary: the system appears transparent and the surface is pure façade; a simulation. That means the user becomes redundant, but not unnecessary. What is an image for, if not being watched?

Hence, that which we want to call *executable cinema* is characterized precisely by the fact of *not suffering of any relevant form of agency*. So, there would be between our provisional genre and conventional graphic interfaces the almost naïf difference Murray suggests to exist between stories and games: the later "always involve some sort of activity", while the former "do not demand anything but our attention" (Murray 2003, 127).

There are two conditions which might cause such situation: either when the operation of the system is impossible, either when it has been alienated. The first case refers to images which agency themselves: works that are not obviously interactive, and because of this are particularly spectacular. We are talking about modalities of generative video, screensavers and demos – executable films in the most elementary sense of the term. The other situation refers to powerpoint presentations, live audiovisual gigs and videogames. The system, under the control of an operator, is updated in relation to (but not necessarily *in response to*) the audience. Now, we pass on to a more detailed analysis of some of these circumstances and their particular audiovisual characteristics.

The *demoscene*

Ironically, the closer we can find of a proper circuit of executable cinema is in the primitive *demoscene* – a hacker subculture that emerged in the end of the 70s, devoted to the development of algorithm-generated animations as a way of testing the limits of the machine and the ability of the programmers. These animations, known as *intros* and *demos*, originally appeared as a kind of splash screen that pirate groups incorporate to the software whose copy protection they had cracked – hence their name. That was the way such groups used to "sign" their works (not much different from graffiti *taggin*).

Since they were nothing more than vignettes, demos needed to attend the compromise of being light and small, so that they did not increase significantly the size of the files in which they would be inscribed. Such directive determined the first productions of the genre, and is still effective even after the demoscene became autonomous from the cracker world and this particular form of distribution. Even today, such works are appraised not only by their plastic beauty, but also by their algorithmic elegance – which can be evaluated by their *size in bytes.* Upon creating a demo, the filmmaker does not only aim for the equilibrium of compositing and montage, but also for the efficacy of the subjacent code.

The concur for material economy is so important that it fundaments the whole structure of diffusion of the demoscene around the *demoparties*, its equivalent of cinema festivals, with exhibitions and awards. The main difference is that the participation in such competitions is not determined by their duration of the work in minutes, but by its *volume in bytes*. One of the most usual limits is 64 kilobytes (65536 bytes). For comparison effects, with this amount of data, it is possible to store only one frame of video using a high-compression codec (such as *Motion-JPEG*). With a similar quantity of binary instructions, a demo such as *.fr-08: .the .product* (.farbrausch, 2000) generates about ten minutes of tri-dimensional animation, with stereo soundtrack, realistic textures and illumination effects.

This is only possible because demos are processed in a more elementary level of computation than digital video. They are not files of audiovisual information codified under redundant standards, but executable programs, whose codification is optimized to the graphics they intend to generate, employing the architecture of the system as an audiovisual dispositif in the best possible way.

Screensavers

Almost every computer user already had contact with these basic programs that are the *screensavers*, so that it would not be wrong to qualify them as the most popular existing form of executable cinema. Just like the demos, the screensavers were not originally meant to be works to be admired. As their name implies, its function is to preserve the monitor, so that the phosphor used in this equipment is not burnt by the continuous exposure of the same image for long periods. To avoid this, the screensaver occupies the pixel grid whenever the system is kept inactive for a certain time, alleviating the monitor of its interface function.

Therefore, in normal conditions, the screensaver is an audiovisual format that does not even allow for the possibility of *play*. The degree of control of the user over these works is so minimal that he cannot even decide when to watch them. They only happen when (and while) the user does not do anything. Moreover, since it is not conditioned by a pre-determined consumption dynamics, and depends on the availability of a screen otherwise instrumental, the exhibition of a screensaver can last from a few seconds to many hours. And, since it presupposes the absence of the system operator, it would be somewhat absurd if it requested its attention.

Keeping these parameters in mind, we should not be surprised that most of the screensavers consist of eyecandy, which can be interrupted at any time. It is as if all of them were but sophisticated variants of *aquariums*, from the most rudimentary bouncing balls to the flying toasters of the seminal *After Dark* (Berkley Systems, 1989) and the evolutive patterns generated by *Electric Sheep* (Scott Draves, 2005).

But the genre is also capable of its own seriality, employing the regular intervals in the system operation to create a narrative arch. The classic *Screen Antics Johnny Castaway* (Sierra Entertainment, 1993) operates as such. This comical screensaver depicts the life of a castaway in a desert island through short sketches. Each time the program is run, we may find the main character fishing, building sand castles, and even receiving the visit of UFOs. Even though the order of the scenes is completely random, the processual character of the screensaver allows for an accumulation of *story* in certain background details. For example: the boat that the castaway is building to escape the island is increasingly complete as the days pass, and his daily routine follows the real world holidays, read from the system's calendar. On Christmas, the island is decorated with a pine tree; on January 1st, with a "Happy New Year!" sign, etc.

Videogames

Contrary to the cases explored so far, videogames appear as a modality of executable cinema in which agency may exist, but is withdrew from the supposed audience. We choose to talk about them, instead of a more obvious format of the genre (such as live audiovisual practices), precisely because they make obvious the provisional limits between interface and surface, agency and spectation.

Moreover, videogames are largely responsible for popularizing and developing the cinematographic dimension of algorithmic systems, giving birth to a series of signifying practices – from interventions in the display (with *game-modifications*) to the recording of gameplay videos such as machinimas and speedruns (an activity that attest the relevance of system operation as a spectacle).

Besides, since they are an eminently social activity, electronic games naturally foresee spectators. After all, "although only one or two people can actively participate, everyone who sits in or walks through the room shares the experience of the game" (Bolter & Grusin 1999, 102). The softhouses always had this in perspective, and never left eventual spectators out of the gaming experience. In different proportions, videogames have always been full of spectacular resources, some of which are interesting only for the audience – or when you have an audience.

A good example of the later are the infamous *fatalities*, the "posthumous" special attacks of the fighting game series *Mortal Kombat* (Midway). These attacks have no utility within the game, since they can only be executed after the adversary has been defeated. Thus, their only function is to humiliate the losing player, as a vulgar display of ability – perfect for when there is an audience gathered.

Videogames can also be approached as mechanisms for the cognitive education of their own gameplay, in cyclical processes that make the player get into the dispositif (Cook). Under these conditions, their operation can reach a *performatic* level that makes clear the spectacular dimension inherent to any graphical interface. Such premise determine games such as *Dance Dance Revolution* (Konami) and *Guitar Hero* (Actvision) – the now popular *rhythm games*, in which the player must execute instructions of growing complexity in accordance to the soundtrack.

In the rhythm games, the division of the screen as an interface of inputs and outputs is exaggerated. The image has two clearly distinguished portions: on one side, it presents the instructions to be executed; on the other, it exhibits animations in response to the player's performance. It is as if, in the screen, there existed both code and its graphical result. The player is responsible for making the connection between them: to (literally) interpret the code and generate the image. Therefore, its attention must be always directed toward the functional part of the screen. The other part, as sophisticated as it can be, only makes sense if there is an audience.

Conclusion

The field of production of this kind of work grows with the appearance of programming frameworks appropriate to the creation of interactive audiovisual, such as *Macromedia Director* and *Processing* – but the greatest sign of this popularity is *Quartz Composer*, a software for the creation of procedural animations that Apple included in every domestic distribution of its operational system from the version 10.4 on.

As they are adopted by artists everywhere, these frameworks establish norms for this kind of filmmaking. A language is consolidated; procedures that can be recognized and legitimized by the field of art-technology – and even that of cinema. Maybe that is why the traditional San Francisco International Film Festival (created in 1957) included in its last edition a programme called *Generator*, gathering twenty works created by "algorithms or other computational processes".

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An indeterminate archive for David Rokeby's "The Giver of Names"

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"I'm an interactive artist: I construct experiences"

David Rokeby, The Construction of Experience: Interface as Content, 1998, p27

In the quote above David Rokeby acknowledges that, as an artist working with computers, his role is not to create objects but rather to create experiences. Rokeby's works, like other new media artworks have a liminal existence on the threshold between material and immaterial things; they are things in potential. New media artworks cannot be considered or treated simply as objects. Their full existence occurs when they are used. Such experiential works present a paradoxical challenge to art historical research. Without a central unchanging object upon which to focus historical investigation, documentation about the work becomes increasingly crucial, but also increasingly contested.

This paper reports on a documentation case-study of David Rokeby's Giver of Names (1991-2004), undertaken in Montreal in 2007 (http://www.fondation-langlois.org/html/e/page.php?NumPage=2130). Through the process of creating this case-study, what we have come to call an 'indeterminate archive,' we have developed an approach to documentation which draws together both the artist's intentions for the work and the audience's experience. The approach creates a dialogue between the ideal, conceptual existence of the work, and its actual manifestation through different iterations and exhibitions in the real world.

The state of the art of media art documentation

Art historians, conservators and curators all look to documentation to support their research and their ability to preserve artworks, maintain collections, and mount exhibitions. Media artworks rarely exist as static, discrete and unique objects, but rather as collections of components, hardware and software which together create time and process based experiences. Such works may change radically depending on the contextual conditions of their staging. Even the material components of such works are subject to rapid change due to technological obsolescence. Thorough documentation is consistently noted by artists, conservators and curators as essential to provide a continuing source of knowledge as to how a particular work manifests over time.

In the absence of a clear, discrete and material art-object, more traditional models of documentation and conservation have adapted in order to offer more flexible paradigms that focus on the processes of creation and exhibition, rather than on static objects. Currently there is a range of preservation and documentation initiatives in practice around the world that vary in their perspectives and approaches to the issues. As part of the case study this field of media art documentation and preservation was studied so as to draw upon existing expertise in the field (Jones, 2007). Missing from many of these models however was a means through which to document user experience. In most instances artists intentions continues to provide the touchstone for how a work will be preserved, restaged and described in the future. And while conservation practice may privilege the artist, the broader context of art history demands an account of the user's experience. While some articulated this as a significant gap in the record, there had not been many systematic proposals to change it.

The strategy of indeterminacy

In our case-study we combined two different approaches. The first, based on the Variable Media paradigm focused on the artist's intentions as a means to record information about the essence (or "kernel") of an artwork, independent of the media in which it manifests (Depocas, Ippolito and Jones, 2004). The second, focused on the experiential aspects of the work, based on how the artwork "occurs" for audience members in the real world. A productive tension forming between these two approaches, and between the "real" and "ideal" versions of the artwork. Both approaches challenge the authority of the other in a useful way, and each offers the other complimentary information - creating a richer, deeper and more complex overall

picture (Jones and Muller, 2007). The gap between artists' intentions and audience experience is not a new realisation in terms of art theory. The poststructuralist critical revolution of the last century has established the authorial position as only one privileged but not definitive perspective on the interpretation of an artwork.

The term 'indeterminate archive' thus reflects the multiplicity of perspectives we have endeavored to include, and also the indeterminacy of the term 'archive' itself. "Archive" as both a noun and a verb, has taken on an array of meanings. From the traditional conception of the archive as both a collection of records and the location in which they are kept, to a less definable and more insidious locale of political and cultural hegemony. The archive is often viewed as the neutral building blocks of history, but through the work of many philosophers, Heidegger, Foucault and Derrida among them, this neutrality is shattered. This term, and the power to construct and sustain cultural memory, has become highly contested. As related specifically to our research question, the idea of privileging neither artistic intent, nor user experience as the primary authority on a work allows for a more dynamic perspective.

Our methods

The basis of our archive is the artist interview, for which we developed a combined interview method that drew together the two research perspectives described above. The medium-independent questions of the Variable Media Questionnaire framed the conceptual and technical aspects of the work. These were placed within an experiential context using tools from human-centered interaction, including "Personas and Scenarios", a technique that involves telling the "story" of an artwork from the perspective of an imaginary audience (Bodker, 2000). Our hybrid method allowed us to generate an interview that has clear links to both the audience interviews and the conceptual and technical information (such as hardware, installation diagrams, etc) that we have gathered. As such the artist's interview can act as a lynchpin for the collection without claiming to provide a definitive account of the work.

User experience is documented using techniques adapted from human-centered design and oral history we interviewed a total of 28 people, including general visitors, invited participants and museum guards. Each of the interviews presents a unique experience of the work, and together they represent a cross section of ages, occupations and self-identified levels of experience with art. The interviews were based on two methods: semi-structured interview and video-cued recall (in which the participant simultaneously describes their experience of an artwork, whilst watching a video of their encounter). Both methods aim to record rich descriptions of the way in which each experience unfolds through time, as well as capturing information about the participants' motivation, thoughts and opinions about the work.

David Rokeby and the Giver of Names

Canadian artist David Rokeby began working with interactive computer-technologies in 1982, and has produced numerous award winning interactive audio-visual installations His work explores the differences and similarities between humans and computers, in particular examining issues of perception, artificial intelligence and surveillance. Rokeby places human experience, and particularly the transformation of human experience through technology, at the heart of his own aesthetic approach to interaction.

This combination of elements makes Rokeby a particularly interesting focus for our approach to documentation. On the one hand Rokeby is a highly articulate artist who is deeply reflective about his process and intent. He has written and published widely about his artworks, and his own "authorised version" of their nature and meaning is widely known – perhaps even more widely known in some cases than the works themselves. On the other hand he is an artist who values, above all else, the audience's actual experience of his works. This provides a rich context in which to investigate the relationship between "real" and "ideal" in a documentary setting. How do Rokeby's experiential intentions relate to the audience's experiential realities?

The Giver of Names is a computer system programmed to see, analyse and describe objects offered to it by participants. In its "ideal" use scenario a participant chooses objects from a pile on the floor and places them on a plinth to be analysed and described by the computer. The computer speaks the description aloud, and it appears as text on a screen showing an image of the object, suspended directly above the plinth. The

computer's descriptions, pulled from its language database, respond to parameters such as colour, form and position, producing phrases that may seem poetic, whimsical or foolish to the human observer, but importantly should not seem completely random.

The work has a long, illustrious exhibition history and has evolved over many versions. Significantly, however, Rokeby suggests in our interview with him that the work has reached its 'sweet spot,' where few changes are envisaged in the future. This creates an excellent opportunity to create a documentary collection that considers the nature of this final iteration of the work.

Working with the Indeterminate Archive – Modes of engagement in the Giver of Names
In the interview with Rokeby within documentary collection he describes his intention to create, in The Giver of Names, an artwork that would exist uniquely for each individual that used it:

> The real intention of this piece...was to create an interface that had as wide a reach as I could possibly imagine… where there was so little pre-constrained that the experience for each person would be absolutely unique and very fundamentally determined by their contribution.

The value of the indeterminate archive is in its ability to hold within it these different versions, views and realities, which, taken together offer a lively and dynamic picture of the work.

In the following example we have particularly focused on the different ways in which the audience members engage with the work. This focus reveals some particular agreements and tensions between real and ideal in the Giver of Names–future users of the archive, we hope, will discover many more. All the quotes by Rokeby, below, are taken from the interview that appears in the archive, as are the audience's quotes, which are identified in the text by the actual first names of the participants.

In the final section of our interview with him Rokeby explains that the most essential aspect of the installation, in his view, is the participant's realisation that the descriptions of objects given by the system are not random. Rokeby explains how the work is carefully orchestrated to create a kind of "stereoscopy" through which the audience is "led to compare the way they see the object and the way the computer sees the object." To achieve this Rokeby has specifically constructed the plinth, screen and projector to create a mirror like relationship between the real object and the image of the object that is presented on the screen.

In Rokeby's view, this realisation need not be immediate. His aim in creating Giver of Names was to "stretch out the feedback loop to allow the participant more time for reflection". He designed the work specifically to lead people to question how it works:

> In this piece you are invited to think as much as you want about how it's happening. And I try in both screens to give as many useful hints as I can about what's going on. You invited to think about what's going on conceptually and technically.

For Rokeby the ideal experience of the work is a "systematic scientific approach", which slowly reveals the nature and operation of the system. He contrasts this with a kind of behaviour which he describes as "object play", in which the participant becomes involved with the objects themselves, rather than with the system as a whole, where participants:

> …seem to be drawn to put as many objects on [the plinth] as possible, and just accumulate and accumulate. They are not really seeing through the system I think if they do that. It's a very common response, but they are getting involved in object play…Whereas the person who is engaged on the sort of scientific method process is more looking and seeing through the system, which is more the operative mode of the piece

The audience experiences recorded in the archive reveal examples of both approaches, but also show how complex and entwined these different behaviours are. At one extreme a participant called Alan describes a highly systematic and thorough approach to the work. After a long time interacting carefully with it he concluded that:

> It's an interesting systematic text generator operating at a completely different register than any human signifying activity. It produces something tangibly outside the field of my experience but yet that is nonetheless inextricable from it.

Others deduced how the system worked not by interacting with it themselves, but by watching others. For example John and Diana, who are both older audience members, observe others interacting with the work for a long while and grasp its operation in great detail, "it excited my curiosity" Diana explains "and I wanted to see a little more of how it worked, the connection between the objects and images". However neither of them felt a need to interact with it themselves. As John points out: "I didn't see any real point in doing it for myself… I don't need to play with it – I've seen how it works." Diana explains their reluctance to interact further by talking about their age and attitude towards museums and other people:

> [T]here were other people there, and I'm disinclined to barge in and push other people out of the way… I'm 61 and Jim is 60 we've been raised in a culture where you didn't touch things in museum and I think that's very strong with me.

John and Diana's ability to understand the work and get any experience from it at all relied on others who were more willing to interact with the objects.

Some of those others were involved in what Rokeby describes as "object play", but the depth and emotion of their experiences suggest that there might be more to this kind of approach to the work than Rokeby has envisaged. The intensity of playing with the toys prompts memories and playful behaviour that often provokes an emotional reaction that the more scientific or systematic approach does not.

Mary-Beth for example never worked out how the piece functions, but had an intense reaction to the toys themselves. As she continues to select and display objects on the plinth, she clearly becomes engaged in another, and perhaps equally compelling, series of reflections about the different "meanings" of the objects:

> I was walking my friend's dog this morning and he likes to take these little animals and shake them as if he had gotten a squirrel in his mouth… [my selection of this toy] was completely motivated by that. I also have a son who's seventeen years old and he still has all of these kind of kids toys, and I was picking through things in the pile I was thinking to myself "I wonder when Duncan is going to get his act together to have a garage sale or something so that we can get rid of some of this stuff that's in our attic

Eric also engages in intense "object play", even though he has a fairly good understanding of the way the system works, because he is trying to communicate something through the objects to other people in the space:

> I wanted to come up with interesting combinations of objects. I invested time in trying to find certain combinations that I thought would be interesting that I thought could give meaning or sense, or a tongue in cheek reference that other people might read. I'm doing what I think is cool, what could be interesting to look at for a few minutes.

Eric's experience, as well as Diana and John's show how important the social relations in the space are to the experience of the participant. By setting up a form of experimental communication and engagement with (in his words) a "quasi-subjective entity", Rokeby has also created a space for observation and experimentation between human beings.

Like Eric, Vincent, spends a great deal of time arranging objects. His aim is to try and challenge the computer, but also he clearly enjoys the arrangement of the objects themselves, which he spends a great deal of time perfecting:

> I was trying to pick objects that were similar – to create a collection – so to see if the device would react by finding similar elements in the objects so all the object were blue – that was the common denominator, I wasn't believing that it would really find that common denominator. But it did - And 'turquoise' did come twice.

For Rokeby attempting to communicate with the system, as Vincent does, through the arrangement of the objects represents an ideal mode of interaction in which the participant has understood the operation of the work and is going beyond experimentation to use the piece as a tool. This kind of behaviour Rokeby

suggests:

> [Maps] on to what my experience was in developing the piece. Finding out the limits of what the system can do and reflecting back on "gee I wonder what my limits are what I don't see because I have these human eyes.

By enticing the participant into a dialogue with an artificial agent, Rokeby intends to provoke reflection on the profound achievement of the everyday human task of making sense of the world.

In other experiences that were recorded the younger participants swiftly understood how the system works and went one step further, by putting their own heads or hands onto the plinth. Whilst the set-up of the installation clearly offers this possibility it is not something that Rokeby talks of in his interview. This creative misuse of the work is an interesting extension of Rokeby's 'ideal', for the participants who try to reproduce their own image in the work are not only asking what does the computer make of these objects but also asking "what does the computer make of me?"

Conclusion

While the artist's own perspective still holds a central position in the indeterminate archive, it becomes one voice of many, part of the dialogue between real and ideal. Each audience interview can only ever be a partial view, but the documentation of these multiple perspectives opens the record of The Giver of Names to a wide field of possibilities.

Rather than creating an authoritative collection of documentation, which establishes a fixed identity for the work, our approach seeks to capture its mutability. By allowing future researchers to understand more deeply the occurrence of the work in a particular place and time we believe that the 'indeterminate' approach offers them a field of possibilities relating to the work, enabling them to act confidently, in their own time and place, in respect to their own conservation work, research, restaging or exhibition projects.

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Transactional Art as a Form of Interactive Art

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Abstract

Interactive media, especially the internet, are often used in an economic context where interactions are actually transactions. We focus on artists who *apply* economic principles and coin those works as "transactional arts". We will introduce a few historic (non-media) examples and then show that many accomplished new media works actually have transactional features. The characteristics of the internet economy seem to facilitate this kind of art form.

In the field of transactional arts, buying and selling are means of self-expression, marketplaces are created as a forms of art, mesh-ups may resemble online businesses, commissioning and division of labor becomes a constituent of the artwork, personal finances as well as the financial markets are artistically reflected.

Most importantly, in transactional arts incentives become artistic material and artists facilitate or participate in all sorts of deal-making. Unlike many purely interactive artworks, transactional art explicitly appeals to the rationality of the participants and often seeks some sort of agreement - in other words - some sort of deal. The notion of value as the entity to be exchanged often becomes the central issue and various forms of capital coexist or are converted into each other. The setting of the transactions may vary as well; some take place within the art world others involve the commercial domain.

Transactional artists create not only aesthetic value but often also economic capital. They therefore tend to fulfill success criteria of both disciplines involved – here art and business.

Keywords: Interactive Art, Transactional Art, Aesthetics of New Media

The Transactional Component

A basic form of interaction may be defined as a kind of cybernetic loop in which two agents (machine or systems) reciprocally listen, speak and think. As an analogy, a simple transaction may be viewed as a circuit, in which two agents exchange some sort of value.

In the artistic context the transactions may involve the artist, the audience, but possibly also subcontractors or contingent market-participants. The notion of value as the entity to be exchanged often becomes the central issue of the artwork. The settings of the transactions may vary: some may take place within the art world, others involve the commercial domain and some artists even create their own marketplaces. In this sense transactional arts stand in the tradition of art-forms taking place in the social sphere.

The notion of interactivity has also been reflected in the field of aesthetics, especially in the context of interactive art. Nicolas Bourriaud (2002, p 112) introduces the concept of relational aesthetics as a "set of artistic practices which take as their theoretical and practical point of departure the whole of human relations and their social context, rather than an independent and private space." Similarly, Jean-Luc Boissier (2002, online) considers relations and relationships as the genuine determinants of interactive art.

In economic terms a transaction is defined as an agreement between a buyer and a seller to exchange an asset for payment or as an economic flow that reflects the creation, transformation, exchange, transfer or elimination of economic value. Interestingly, both, Boissier and Bourriaud include all sorts of social interactions but do not refer explicitly to transactions, though outside of the art context probably one of the dominant forms of social interaction.

Duchamp as an Early Transactionalist

Marcel Duchamp may be considered as an early “transactionalist”. In 1919 Duchamp paid his dentist, Daniel Tzanck, a passionate art collector, with a hand drawn enlarged facsimile cheque as compensation for services rendered and as a piece of art at the same time (Judovic,1998). In 1924 he issued 30 “Monte Carlo Bonds” over 500 Francs each, and apparently raised funds from his friends in order to play Roulette at the Monte Carlo Casino promising 20% p.a. interest redeemable in three years. However, his gambling strategy did not beat the odds, but he didn’t lose either and paid only once 10% interest, one year later. In purely financial terms, the purchase of the bond may appear as a loss, but considering the deal as the acquisition of an original Duchamp artifact (that even earned a 10 % return) it may be construed as a great buy.

As with his ready-mades, the accomplished artist Marcel Duchamp creates value by an act of declaration - here in the form of an amicable deal (leading to a contract as an artistically designed and signed bond certificate) with his audience, i.e. collectors. Interaction becomes transaction manifested as a financial instrument, issued and authorized by a self-empowered artist who actually benefited financially.

Disinterestedness, Value and Conversions of Capital

Artworks with a transactional component tend to challenge a fundamental western aesthetic conception demanding art to be entirely separated from the economic sphere. So was Duchamp repeatedly accused of lacking detachment from material concerns, though he appeared to be mainly interested in the speculative and provocative aspects of his works.

Does transactional art automatically violate the principle of the autonomy of art? If art today can reflect any subject and strategy of any context in society, then why not the economic transactions which ubiquitously surround us?

Pierre Bourdieu (1945) referred to various concepts of value as “forms of capital”. He differentiated between economic (financial), social (concerning relationships) and cultural (referring to knowledge) forms of capital. Later, symbolic capital (social status) was added. We will observe that in transactional artworks various forms of capital are simultaneously created and potentially converted into each other. These “conversions” lack, of course, a clearly defined conversion rate. Instead, they may remind us of Freud’s (1960) understanding of humor as a kind of joyful play with the ambivalence of words leading to a surprising revelation of a double meaning in a joke.

Examples of Transactional Arts

Denial of Profits – Economies of Dissipation

In many cases where a transaction happens between artist and audience, the artist deliberately wastes or destroys a potential gain. Thereby he apparently contradicts the central premise of modern economics assuming a “rational agent” pursuing maximal profit (this assumption has extensively been questioned within the economic discourse). These works may be interpreted in the context of an economy of dissipation in the sense of Georges Bataille (1946), who states, that the accursed share is an excessive and non-recuperable part of any economy, to be spent in either in the arts or non-procreative sexuality in order to prevent catastrophic outpourings in war.

In 1958 Yves Klein sold void space in Paris for gold, which he threw afterwards into the river Seine. Fifty years later Zoe Sheehan Saldana breeds plants as an online performance and gives them away at the end of the project. In the 70ties happenings provided all sorts of amenities to the audience. In the light of today’s “attention economy” where perception is valued in the currency of “eye-balls”, these kinds of deals may appear less one-sided.

Internet culture and economy are highly influenced by the idea of the give-away: free software, the open source-movement, Wikipedia and most Web 2.0 characteristics rely on an economy in which sharing and giving are expected as a default attitude. If one may want to refer to these interactions as transactions which are often driven by idealistic motivations, then the payments seem to be based on primary non-monetary

rewards. Of course, the idea of a free sample as a vehicle leading to further transactions is a well established sales strategy widely applied in the digital economy.

Bridging Various Arenas of Exchange

Creating counter-economies which are more or less entrenched with the real world is a strategy only few artists have the resources to do. The Dutch artist group Atelier van Lieshout designed for their utopian state-like territory in Rotterdam a currency called AvLs, which are convertible at an exchange rate of 1:1 into beer.

Entrenched with the outside world are also many economies which emerged around virtual worlds and multi user online games economies. For example, here not only players and virtual artifacts can be traded, but also the off shoring of labor intense activities to low wage countries is facilitated.

Accounting – Financial Diaries

Artists like Danica Phelps reflect their personal life in the form of a diary on daily transactions. The transactions stand for "emotional exchanges" in analogy to an accounting book keeping record of the in and out flows of cash.

Burak Arikan discloses in the online project *MyPocket* his personal financial records to the world in order to predict his future spending. After a predicted transaction happens, its receipt is marked with a green stamp, which shows the probability of the prediction.

Value Creation through Labor

Karl Heinz Jeron in his piece *Will Work for Food* creates small robots, which are sent to the audience in exchange for food sent to the artist. The robots can be "rented" for food and have the ability to draw and whistle. Since the robots are not the consumers of the food therefore the installation seems to subsidize the artist himself. The recipient provides food and the artist sends him a robot in return, which performs an audio visual artwork, an aesthetic product, which can be kept.

Mimicry of Organizational Structures and Financing Models

Many artists especially media artists have actually applied business practices. The art groups Etoy and RTMark not only mimic the organizational structure, appearance and rhetoric of multinational corporations, they also issue stocks and/or mutual funds in order to allow the audience to support their activities. Interesting enough, these groups use capitalistic financing techniques in order to realize critical artworks with an anti-capitalistic flair. The transactions involved may be seen as some sort of commissioning or sponsoring which has become part of the artwork itself.

Distribution - Shops, Buying and Selling as Artistic Expression

In transactional arts buying and selling may become means of artistic expression. Christine Hill has chosen the form of a shop for her installation "Volksboutique" in which she initially sold objects. During her "Ebayaday" performance curated artists could sell their work.

The creation of social capital and a way to overcome certain mechanisms of social exclusion provides the Spanish art group "Mejor Vida". All sorts of subversive goods and services, "items for a better life", can be ordered through this online shop: fake subway tickets, student ID cards stamps "as well as printable barcode stickers supposed to lower prices".

So called "auction artists" (Atkins, online) use existing market platforms such as Ebay for highly conceptual artworks to auction off e.g. their time and availability (Carey Peppermint), private data (Jeff Gates), or their "body, with minor imperfections" (Michael Daines). Often artists experience no demand for these offers at all. Suggesting potential transactions becomes the artwork, even if these transactions actually never happen.

Online Customization, Commissioning and Mash-ups as Value Chains

The economic principle of division of labor has become the artistic attitude for artists like Andy Warhol, Jeff Koons and Mark Kostabi who outsource parts of the creative production. In media art it online commissioning may be viewed as an extension to this trend.

A.Koblin initiated with the project *The Sheep Market* a collection of 1000 sheep created by workers on a online work platform. Each worker was paid 0.02 US$ to "draw a sheep facing left". The artist then offered these drawings as "lickable stamps" for 20$ each to be ordered via the website. In *Ten Thousand Cents* he and *T. Kawashima* let the online workforce create a digital representation of a $100 bill. Thousands of individuals painted a small part of the bill without knowledge of the overall task.

Related to his auction art are *Carey Peppermint's* online commissioning activities, where he allows the EBay audience to conceptualize an artwork. In the tradition of conceptual art he will then execute these tasks and document them. IP rights are shared between him and the commissioner.

The art-group *We Make Money and Not Art* uses Google ads to generate revenue from the hits on their website. For the digital activism project *Google Will Eat It Self* the group *Uebermorgen* designed a value chain as a closed circuit of transactions: they first generated profits by manipulating the Google ad-sense program and used these funds to buy stocks of Google.

Another way of a business mesh-up and a new way of reflecting Intellectual Property licensing and the re-use of creative products is work by *Philippe Parreno*. He acquired the rights (for 500 Franc) of a digital Japanese manga character called *Annelee* from an animation company, revamps the design and then allows other artists to use it for their work, i.e. create artworks with it.

Facilitating the Exchange of Values - The Market as an Meta Art

A. Galloway states that today's internet protocols are "synonymous with possibility" and that the internet facilitates the economic form of market places. Media art has always been the creation, design, structuring and control of possibility spaces (the set of choices offered by non-linear media) and artists have attempted to continuously expand these. One transactional artistic strategy is the creation of market places itself. The artist may not participate in any transaction, but merely provide the platform for potential transactions.

Without an explicitly artistic intention *Robin Hanson* created *Idea Futures* a market platform to bet on opinions. He considered this online market a potential tool for collective decision making and won the Prix Ars Electronica Price 1995 for this work.

The art foundation *Mediamatic* hosts a matchmaking service facilitating, e.g. encounters with *Russian Brides*. This marketplace is meant as a contribution to the discourse around foreign workers in the Netherlands and a critical reflection of the respective immigration policies.

Christin Lahr initiates a market for the exchange of personal data as a critical work on privacy issues in the internet. With *SellBack* she allows the audience to evaluate their privacy data and then offer these data on her market platform.

The project *Open-Clothes.com* envisions a platform for all transactions and interactions around the design and distribution of customizable clothes and won also an Ars Electronica distinction award for communities in 2004.

For these artistic online markets the principles of web 2.0 internet economy seem to apply. As the ideal media to match niche demand and niche supply (according Chris Anderson's (2006) Long Tail assumption) these markets become niche products themselves, often defying their lack of liquidity. Collages of transactional modules may be meshed-up in this art form, similarly to the value chains of online businesses.

An actually functioning real time market running over years have the art group *Derivart* installed in the centre of Barcelona. They founded the *Bar Bolsa*, a pub in which the prices for alcoholic drinks fluctuate according to demand.

Reflecting the Meta-Business of Finance

Finance is considered the “brain of an economy” and as a service sector facilitates the allocation of capital and the mitigation of risks within a society (and/or the global economy). The mechanisms of risk and reward, investing and speculation have interested artists such as Duchamp, as we saw earlier. However, this field may not be extensively explored by artists.

Relying on his expertise as a non-professional stock trader, artist Michael Goldberg played the stock market for three weeks from a gallery generating charts and other forms of data visualization as output. He had built a form of “strategic interface” to the online market in the form of a tower. Goldberg had raised 50.000 AU$ from befriended investors, traded without personal risk and closed with a 1000 AU$ loss[1].

Creative Deal-Making

Though many transactional artworks seem to rely on some sort of agreement, not many artists address them openly. *Christin Lahr* instead, makes agreements and contracts the explicit subject of her works. In the German project *Nichts Zu Verschenken* (*Nothing to Give Away*) she offers the audience to sign a gift contract about “Nothing”. This contract can later be sold like any artwork and a profit can be made. If the audience does not sign, they also have “Nothing”, but they do not have the right to benefit from the appreciation in value – the artist claims.

Conclusion - Principles of Transactional Arts

Many interactive art works make use of interactive media in a transactional way and transfer values. The artists take seldom profit and in case of financial gains they are often deliberately given away. This may be part of the aesthetic heritage to 18th century aesthetics and the requirement of the disinterestedness of the aesthetic judgment.

The transactions involve various forms of capital, e.g. cultural, social, economic and symbolic capital. The aesthetic success of a transactional artwork seems not to depend on a successful transaction. So, even in the cases of unanswered auction art offers and illiquid markets - one may argue in favor of transactional art – their aesthetic value as a form of cultural capital is not diminished.

Artists using interactive media design possibility spaces. Artists using transactional media work additionally with incentives. As governments steer the behavior of their citizens e.g. with tax incentives, artists now facilitate and/or execute transactions as part of their work. They craft deals and foster the exchange of values. Sometimes they design decision architectures where they may “nudge” participants into desired behaviors.

The social positioning of agents involved plays an important role in transactional art. Their actual negotiation power becomes a constituent of the artwork. Therefore transactional artworks are always “aspectual” and relative to the social positions of the agents involved. The characteristic of variability of interactive media and transactional media may haul this kind of art.

Artists reflect their negotiation power in various ways, often with an audacious gesture of self-empowerment. The artist often creatively circumvents the weaknesses of his social position and claims the possession or creation of fictitious values. As demonstrated by Duchamp non financial value were successfully exchanged for other forms of capital and generated, besides the artistic merits, financial profits for the artist.

Often transactional artists provide a meta-platform for others to post their offers and demands or even design incentive-structures .In this sense, transactional art leads often to meta-art works enabling creations by others in general and/or artists in particular.

Since many transactional artworks involve deal-making, an element of rationality is characteristic for the interactions taking place. Whoever the counterparty is, she has to accept the offer preceding the transaction.

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Therefore transactional art involves a kind of agreement or contract which may be implicitly or explicitly stated. The core function of contracts is to organize the transfer of values; therefore it is not surprising that transactional artist actually reflect this kind of social agreement. The proposed deals have to appeal to the value systems and rationality of the participants, even if they come from different social contexts. This may be seen as a refreshing alternative to the proven artistic strategies of the dysfunctional and absurd.

As a highly interdisciplinary art form, transactional art offers insights in how disciplines may inform each other and how interdisciplinary works are actually judged by the contributions they make to *all* disciplines involved and to what extent they fulfill the success-criteria in the different domains, here the art and business world.

Many of the transactional artworks we saw spell out a radical critique of capitalistic principles. With the development of the internet as a transactional medium and its reflection by artists there may be future potential for more constructive explorations of social interactions in general and capitalism in particular. Transactional art may be highly demanding to its participants but - since always situated within the contexts of economic resources and spheres of power – could reward society with some valuable insights.

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Nanoart: First Steps Beyond the Columns of Hercules

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ABSTRACT

As in the last century, with all the "-isms" and other nouns and adjectives with which various artistic movements were described, both contemporaneously by the participants, and later by historians and critics, the term *Nanoart* signifies, in its iconic essence, a new way of "making art". Nanoart is a creative, aesthetic process, which makes use, in its research and its realisation, of nanotechnology. Nanoart can be compared to a journey Beyond the Pillars of Hercules, to a far-away universe going beyond the limits of our world, where everything is already known, classified and photographed. Artists like Giuliana Cunéaz, Loris Gréaud, Mikael Metthey, Alessandro Scali & Robin Goode, Grit Ruhland, Paul Thomas, Victoria Vesna, Chris Woebken, James King and Michael Burton create a debate around our state of being contemporary. Nanotechnology strongly introduces the notion of Art 2.0. Artworks are the result of a collective creation process that implies synergies between scientist, artist and public. Nanotechnology transforms the imaginary of our bodies from crippled to mutant and modifies our point of view. Imagination prevails over image, desires are already memories.

KEYWORDS

Nanoart, Art 2.0, Imagination, Infinity, Body.

As in the last century, with all the "-isms" and other nouns and adjectives with which various artistic movements were described, both contemporaneously by the participants, and later by historians and critics, the term *Nanoart* means, in its iconic essence, a new way of "making art". Nanoart is a creative, aesthetic process, which makes use, in its research and its realisation, of nanotechnology. Nanoart can be compared to a journey Beyond the Pillars of Hercules, to a far-away universe overcoming the limits of our world, where everything is already known, classified and photographed. Artists like Giuliana Cunéaz, Loris Gréaud, Mikael Metthey, Alessandro Scali & Robin Goode, Grit Ruhland, Paul Thomas, Victoria Vesna, Chris Woebken, James King and Michael Burton create a debate about our state of being contemporary. Nanotechnology strongly introduces the notion of Art 2.0. Artworks are the result of a collective creation process that implies synergies among scientist, artist and public. Nanotechnology transforms the cripped imaginary of our bodies into a mutant one and modifies our point of view. Imagination prevails over image, desires are already memories.

The first artwork created in 2006 by Alessandro Scali (Turin, Italy, 1972) & Robin Goode (Cape Town, South Africa, 1978) was a nanosculpture titled *Beyond the Columns of Hercules.* It was created by the collaboration of the Polytechnic of Turin Physics Department. The artwork is not directly perceptible by the human eye but it needs both a microscope and imagination to be seen. Looking through microscope lenses, we see footmarks in black-surrounded environment. There is something of mysterious and uncertain: we do not know where those steps begin and where they finish, who makes them, when and why some footmarks are smaller than others. More over we also do not know why footsteps don't draw a linear walking but they are so confused. Exactly like Nanoart the artwork is only a rough sketch, and further developments are coming.

In the same year Loris Gréaud (Eaubonne, French, 1979) at London Frieze Art Fair presented the show *Why is a Raven Like a Writing Desk* ***(FIGURE 2)***. It consists of a series of nanosculptures realized together with the French National Centre of Scientific Research. The title refers to an unresolved riddle from the book *Alice in Wonderland* by Lewis Carroll. Quoting the artist**: "** This was a show where believing is more important than seeing". In 2007 Grit Ruhland (Gera, Germany, 1979) created with the collaboration of the Technische Universität Dresden, another nanosculpture titled *Slipper for slipper animalcules* ***(FIGURE 3)***. Grit Ruhland follows a different path: the nanoworld, like all possible worlds, potentially already contains its paradoxes and provocations. The artist should bring them to light.

So those artists begin a profitable research on the concept of infinitely small space 30 years after the short

documentary film *Powers of Ten* written and directed in 1977 by Ray and Charles Eames and 40 years after the science fiction film *Fantastic Voyage*.

The infinitely small leads us to another theme: the relationship between the visible and what escapes the control and the dominance of the eyes. The sight in Europe and West societies has a privileged position compared to the other senses, either as an instrument of knowledge or as a way of interpreting meaning. However at the end of 20th Century the sight supremacy has been questioned. The cinema has been the first medium to bring out clearly the deficiencies of vision, reflecting upon the sequence of images shot sequentially many times per second and putting together artificially to mime action. I am thinking of a film like Zemekis' *Contact* (1997), where the camera, substituting for the eye, is incapable of offering a different world from our own; or of the famous opening of Bunuel's surrealist film *Un Chien Andalou* (1929), where the eyeball is cut open, as if it warn us that it is with other senses, or rather with other faculties, that we must deal with vision. I am also thinking of the more recent Christopher Nolan film *The Prestige* (2006), where sight produces illusions which merge with the imagination. Nowadays, through television, computers etc. we have got the creation of digital images, whose basic characteristic is that they can be altered in real time: we can change their form and content through a simple act of human intervention.

The artworks of Alessandro Scali & Robin Goode, Loris Gréaud and Grit Ruhland go a step further: they remove the direct view of the image, and cancel the acquired superiority of sight. This is both a paradox and a provocation, as in every revolutionary artistic movement. The paradox, of course, is that for a visual art we are offered a "nonvision". With nanotechnology the work is inscribed on a silicon wafer, but even with the help of a microscope, which is essentially a substitute for the eye, it cannot be seen completely, but it is only suggested. And here lies the radical nature of the idea: the spectator is expected to contribute personally to the creation of the work. With the help of a title, to establish a context, he finally has to use his "interior eye" and to reawake his imagination, hitherto blocked and handicapped by so many, too many invasive external images.

In the course of the XX century, however, we must admit that this need is becoming more and more a desperate urge to see everything. Literally speaking, it is the loss of hope that the invisible will continue to keep us company. As if we were dealing with one of the natural resources of which we will be hopelessly deprived because of unceasing exploitation; as if the invisible was really the opposite of the visible, and the increase of one could not correspond to the diminution of the other; also as if the invisible was not a promises of other things to see, which the visible itself always holds.

Moving forward the juxtaposition of visible and invisible, we find artists like Victoria Vesna (Washington D.C., U.S.A., 1959). In 2007, with the collaboration of James Gimzewski she realized *Blue Morph* ***(FIGURE 4)***. The project changes our way of relating to silence and makes the in-audible audible. Blue Morph is an interactive installation that uses nanoscale images and sounds derived from the metamorphosis of a caterpillar into a butterfly and it is strictly connected with the John Cage artistic research. Like his 1952 composition *4'33",* we discover that there is no such thing as silence. Something is always happening that makes a sound and inside the silence we can discover worlds of rumor.

We have seen how those artists work together both with scientists and research centers in order to create their artworks. While in contemporary art the outsourcing is a common practice where artists detain all the "creative power" and collaborators are merely executors, with nanotechnology artists establish a collective creation process. Loris Gréud affirms: "The process is much more important than the result – the intermediate process is always the most exciting, and resolution is always deceptive". This assumption, together with nanosculptures' innate ability to stimulate the imagination, creates a cooperative art, an art 2.0.

Bodies and their epitaphs. Another key point is the creation of a context where the human body losts its human nature. In less than one century art passed from the representation of crippled body to mutant body. If the German painting, especially through the Dadaism artists Otto Dix, George Grosz and Rudolf Schlichter, ***(FIGURE 5)*** soon after the first world war represented a wide repertory of prostheses – crutches, wheelchairs and so on – documenting the crippled and the "collage body", the Nanoartists document the mutant Body. For example the Michael Burton *Nanotopia* ***(FIGURE 6)*** refers how people currently use

their bodies as a last resort, to sell their hair, blood and kidneys. Nanotopia then envisions a future where the poorest men utilize new possibilities of fusing nanotechnology and the body as real-estate. In reaction to this use of the body, the film also visualizes the changes in bodily aesthetics within the upper classes.

To conclude, should Nanoart also represent a sort of reverse trend in contemporary art? In an age of artistic *grandeur* – based on the star system, with imposing works and enormous exhibitions and fairs – perhaps there is a need for a healthy and decisive *downsizing*. Nanoart is an art that makes itself small, that plays itself down to the point where it makes itself invisible.

Let's put it this way: Nanoart is an art which is not too eye-catching.

The Black Box

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Abstract

In societies where industrial conditions of production prevail, the artist's equipment tends to become a black box. The photographic camera and the computer, for instance, are essentially black boxes. The contemporary artist increasingly confronts technologies and systems whose internal operation appears mysterious. The very tools on which her creative work depends are fundamentally opaque. Many digital artists and designers, for instance, use computers without understanding even the basic principles of computer hardware or software engineering. They depend on tools whose mechanism is veiled in ignorance. The opacity of the artist's equipment, which is unprecedented in the history of world art, is a defining feature of what is often called "media art".

The principal purpose of this essay is to clarify the fundamental properties of the black box, to describe its role in contemporary media art, and to suggest various possible courses of action in response to its ubiquitous presence. I claim that the "black box" is the fundamental concept of media art theory, because it defines the specificity of its object. The technical is always already intertwined with the social. This essay argues that the concerns of media art theory must be reconsidered in recognition this fact.

Keywords

Actor-network theory; apparatus theory; circuits; experimental media; black boxing

Introduction

In societies where industrial conditions of production prevail, the artist's relation to her equipment is subject to a process that I shall term "black boxing". The contemporary artist increasingly confronts technologies and systems whose internal operation appears mysterious. The very tools on which her creative work depends are fundamentally opaque. Many digital artists and designers, for instance, use computers without understanding the basic principles of computer hardware or software engineering, or even the algorithms that underpin widely used image filters. Their work depends on artifacts whose mechanism is veiled in ignorance. The opacity of the artist's own practice, which is unprecedented in the history of world art, is a defining feature of what is often called "media art".

The principal purpose of this essay is to clarify the fundamental properties of the black box, to describe its role in contemporary media art, and to suggest various possible courses of action in response to its ubiquitous presence. I will describe the black box via a sequence of particularizing approximations, beginning with a general characterization and then adding more and more specific details.

Assemblage

First of all, a black box is an assemblage of actants. This initial characterization is based on the work of Bruno Latour, Michel Callon, and other sociologists in the tradition of Actor-Network Theory (ANT) (Latour 2005).

Classical social theory often regards tools as inert or passive vehicles for the execution of human plans, and so lacks a suitable vocabulary to describe the contribution of non-human agents. To make up for this lack, ANT relies on the concept of "affordance", developed in the branch of psychology known as ecological optics (Gibson 1986). The word "affordance" denotes the action possibilities that characterize an object. A cup "affords" grabbing, lifting, drinking, pouring, throwing, spilling, shattering, kicking, and many more actions besides. Our purposeful actions do not exist in isolation from the objects that authorize, facilitate, support, and encourage them. Agency does not belong to a single center of action, such as a rational person capable of making choices. Rather, agency is distributed across the whole ensemble.

A person can act only in the context of the possibilities afforded by things, animals, other persons, etc. It is thus misleading to describe action solely as a human responsibility. We may wish to say, instead, that any activity is distributed over a network of human and nonhuman agents. But the word "agent" confusingly suggests that inanimate objects like cups, chairs, and computers have conscious intentions, which would amount to blatant anthropomorphism. To avoid this implication, ANT replaces the word "agent" with the alternative term "actant", borrowed from the theory of narrative literature. An "actant" is any element that plays a part in an action, without necessarily formulating plans or forming intentions. I shall henceforth say that the skills of an actant are "articulated" through the affordances of other actants. The word "articulation" is meant to highlight the reciprocal co-construction of the various participants in the ensemble. To take up Latour's famous example: A person holding a gun becomes a criminal, and a gun held by a criminal becomes a murder weapon (Latour 1999).

Apparatus

I do not claim that every assemblage constitutes a black box. The description needs to be refined as follows: A black box is an assemblage bearing a functional character. It has a predefined range of possible inputs, plus an internal mechanism that determines how those inputs reliably produce certain outputs.

This functional character is normative. There are "proper" ways of using the device, and these must be learnt. Thus the device is designed for a subject capable of learning, a subject whom I shall call the "compliant user" or "operator". The role of the compliant user is defined mainly in virtue of the skills required to operate the device.

I shall henceforth speak of the system of categories built into the standard usage of a functional thing as the *repertoire* of that device. Aperture, focus, and exposure time belong to the repertoire of photography. *Competence-in-use* consists in setting the correct inputs to realize whatever intentions the operator has. A repertoire is a stable distribution of responsibilities between actants in an ensemble. The photographer must know how to operate the machine; the machine must produce a reliable result.

The repertoire of a black box can be understood in part as *the compliant user's sense of what is possible*, the experienced limits of what can be done with the device. To comply with the device is to master its repertoire. The personal intention of any compliant user constitutes an individual articulation of the chosen repertoire. The compliant user learns to select one or more of the predefined inputs, with the intention of producing some outcome. The operator of a device is not a universal subject but a historical set of norms created (consciously or not) by the engineers and designers who planned the device (Maidell 2002, 8).

Prague-born philosopher Vilém Flusser, who had a keen awareness of the prevalence of the black box in contemporary life, wrote extensively about the philosophy of photography. The photographer, Flusser argued, believes that she is using the camera as a tool, and so as an instrument of her will. And this is in a restricted sense true, since a photograph is in most cases the realization of a photographer's intention. But the artist can only intend what the camera can do. To take a photograph is to make a selection out of the range of possible choices already built into the design of the camera. The intention of the user is constrained by the range of inputs that the system is designed for. Flusser puts the point forcefully:

> In the act of photography the camera does the will of the photographer, but the photographer has to will what the camera can do (Flusser 2000, 35).[1]

The compliant user often relates to such a device as one thing rather than as a multiplicity. It is natural to describe the camera as one entity with its own intrinsic properties and powers. This compliance underpins the conviction that every art form involves a distinct medium with its own essential properties. Compliant users are convinced that they know what photography essentially is, because the repertoire that characterizes their usual mode of interaction with the device has been relatively stabilized. This stabilization is often sustained by institutionalized social practices, such as the curricula of media art schools and the contents of textbooks and instruction manuals, so that its obviousness appears to lie beyond discussion.

But a medium is not a thing with intrinsic properties. A medium is an ensemble. The existence of "electronic arts", for instance, presupposes a collective of actants that range from the human electricians to the switches, accumulators, electrodes, electrons (etc.), without any of which no work could possibly get done. The entities that enter into an ensemble comprise the *inventory* of that ensemble, and the relations between entities in this inventory comprise the ensemble's *composition*.

I shall henceforth use the term *reification* to describe any practical attitude that relates to an ensemble as if it were a single thing bearing essential properties and powers (Lukacs 1971). To forestall any reifying interpretation, then, I propose to replace the term *medium* with the term *apparatus*. An apparatus is a functional ensemble of actants where the distribution of tasks and responsibilities is organized around a stable and well-understood repertoire (T. De Lauretis and S. Heath 1980). To describe an apparatus is to describe its inventory, composition, and repertoire. A black box is an apparatus, in this sense.

Circuits

Consider the mainframe computers of the 1950s and 60s. The computer was not directly connected to the printer. The circulation of the tape required the presence of human operators linking the programmer with the mainframe computer, and the mainframe computer with the printer that would output the results (Ceruzzi 1998, 96). By thus "mediating" between these various actants, the operator sustains the integrity of a circuit that has been previously disaggregated into a sequence of distinct stages.

A *circuit* is an apparatus consisting of several micro-apparatuses arranged into input-output chains. The outputs of one stage become the inputs of another stage. In some instances, the input of one stage is also the output of the same stage. An example is the process of conveying a parcel through a courier service, where the parcel is supposed to arrive intact. In other cases, the element that circulates must undergo changes, which can be reversed at a later stage in the circuit. The original textual input of an electric telegraph system must be recoverable at the end of the transmission process. In contrast, some systems, such as a water purification plant, are designed to produce irreversible changes in their inputs.

The analysis of a black box will pay special attention to the ways in which circulating elements are preserved and/or transformed. It will also describe the vulnerabilities to which the process and its elements are subject. For instance, the transportation of a parcel is subject to damage. I shall use the term *tolerance* to describe the vulnerability to loss or damage of the components of a circuit.

In many cases, the compliant user need not worry about the circuit's internal composition. The sender who relies on a courier service does not normally concern herself with the processes that deliver the parcel to its recipient. But there are circumstances that drive users to seek out greater intimacy with various stages of the circuit. An artist who calls on a courier service might, for instance, avoid sending an artwork on a Friday if she knows that the parcel will sit in a hot storage room over the weekend. The wish to avoid certain points of vulnerability will thus sometimes drive users to seek out greater understanding of the stages in a circuit.

At every stage in the circuit, the circulation process can be diverted, temporarily delayed, or permanently blocked. A *gatekeeper* is any actant capable of blocking, delaying, or diverting passage across the circuit. The concept of gatekeeping was proposed by social psychologist Kurt Lewin, who argued that many social processes are circuits where members of some pool of resources (food, people, money, etc.) can potentially reach, or fail to reach, some destination via a chain of steps. Each step corresponds to one or more gates (Lewin 1947).

Gatekeeping functions are not the exclusive province of human agents. Examples of gatekeepers include not only the switchboard operators of a telephone network but also the logic gates of an electronic computer.

The presence of a gate always implies the possibility that a given flow may fail to occur. A gate must by definition be capable of blocking circulation. The actant who desires passage *depends* on the gatekeeper, and this dependency increases when the gate is an obligatory one. An obligatory passageway is a gate whose

keeper has been rendered indispensable in virtue of the organization of the circuit. Every circuit is a network of dependency relations.

An obligatory passageway is often guarded by a special kind of actant, the *spokesperson*: one or more human agents who take it upon themselves to articulate or explain the behavior, identity, interests, thoughts, desires, or tendencies of other actants (Callon 1986, 25).

A spokesperson is not necessarily a gatekeeper, but many gatekeepers are also spokespersons, and many spokespersons either are, or desire to become, gatekeepers. The spokesperson often defines the terms of a problem such that their solution requires passage through a particular gate (Ibid., 26). This strategy defines the gate in question as an obligatory passageway, and so cements the social power of the gatekeeper. An admissions tutor in a university program, for instance, "solves" the "problem" of the excess of applicants for a given number of student places by establishing a method of selection.

A circuit often contains *points of aggregation*. These are moments that bring different actants together for a (more or less) definite period of time. The aggregation is often subject to gatekeeping. Members of a committee must normally be appointed or invited. Participation in a film or art festival requires approval by a jury or selection panel. Aggregation points can, however, arise without the intervention of a gatekeeper, such as for instance crowds that are spontaneously formed. One of the tasks of a critical apparatus history is to identify and describe the gates and aggregation points of a circuit, as well as the processes (debates, negotiations, tests, etc.) that take place in them.

A circuit, then, is a special kind of apparatus whose inventory consists of functional micro-apparatuses arranged into input-output chains, subject to damage and other forms of vulnerability, and punctuated by the presence of gatekeepers, spokespersons, and points of aggregation. A black box is a circuit, in this sense.

Automated circuit

More specifically, a black box is a circuit whose operation has been relatively stabilized. Its existence, inventory, and composition are taken for granted, and are no longer subject to discussion and controversy. Given certain user input(s), the device should be capable of generating the expected output(s) without any further human judgment. Once a photographer has clicked on a camera, for example, the machine should produce a picture without additional assistance.

When the actual outputs do not confirm habitual expectations, users typically assume that the device has malfunctioned and so call upon specialists to repair or recalibrate it. Human intervention is excluded only while the device works as intended. But this assumption cannot be made as a matter of course. Describing the modern computer architecture, scientist John von Neumann observed: "The remarks… on the desired automatic functioning of the device must, of course, assume that it functions faultlessly." (von Neumann 1945, paragraph 1.4)[2] The category of automatic functioning thus embodies an idealizing assumption. It is ideal in the sense that perfect performance cannot be absolutely guaranteed. "Malfunctioning of any device has… always a finite probability." (Ibid., paragraph 1.4) The fact that a certain input will automatically produce the expected output will not necessarily be realized in practice. The possibility of failure is an essential feature of any automatic system.

At stake here is the question of intimacy with an apparatus. Intimacy often manifests itself in the ways people handle malfunctions. The person who is not intimate with the device is not equipped to respond to malfunctions, because this requires seeing the device not as one entity but as an ensemble. The malfunctioning device often loses its apparent unity and splinters into a collection of parts that have to be inspected, tested, and perhaps modified or replaced. What was once treated as one is now viewed as many (Labour 1999, 183-4).

The console of an IBM 7094 mainframe computer, for instance, had rows of small blinking lights indicating the state of each bit in the various registers of its central processor. Media historian Paul Ceruzzi had described how human operators were able to read the binary content of every register directly, and if necessary execute a program instruction by instruction: "Such 'bit twiddling' was exceedingly tedious, but

it gave operators an intimate command over the machine that few since that time have enjoyed." (Ceruzzi 1998, 73)

Intimacy is mobilized in a particularly urgent fashion when malfunctions occur. Knowing what to do in response to apparatus failure is a criterion of an agent's intimacy with the circuit. A compliant user often cannot respond to malfunctions, and so must depend on operators who are themselves intimate with the circuit. The existence of compliant agents who must accept such a dependent relationship due to their lack of intimacy with the apparatus is an essential property of every black box. The operator becomes a spokesperson for the device, explaining the failure and prescribing a solution, as well as a spokesperson for the user, specifying the nature of her problem and offering one or more possible courses of action.

Media Art Theory and History

In other words, *a black box is an apparatus that has become "opaque" to the compliant user*. To understand the black box is to understand the historical sources of this opaqueness. And to understand those sources is to reconstruct the formation and development of the black box. As Latour has noted, the history of a black box often reveals the presence of uncertainties, doubts, hesitations, debates, failed attempts, repeated trials, and fierce controversies (Latour 1987, 4). The aim of a theory of the black box is to recover the history of a black box "in the making", and so no longer taken for granted.

Consider for instance the case of film art. The standard way of writing its history and theory takes the black box for granted. Virtually every mainstream treatise written about film aesthetics, for instance, typically enumerate and analyze the possible ways in which the repertoires of the cinematic black boxes can be used artistically. To this end, they often include sections on framing and composing the shot, selecting a camera angle and position, designing the color and lighting, moving the camera, editing the film, etc. The fundamental categories built into the design of the black box are thereby taken for granted. This kind of media art theory therefore highlights and celebrates the creative actions of talented compliant users, such as the canon of great directors. I have no intention of denying that users of a black box can produce works of substantial artistic value. But the standpoint of the compliant user is not the only possible way of writing the theory of art.

An alternative approach might for instance direct attention to those artists who have struggled to open the black boxes on which their practice depends. Instead of praising the standard canon of film directors, theorists would examine those artists who engage experimentally with their black boxes. In contrast to the compliant user, an "experimental" user confronts a black box with nonstandard inputs, even though such actions are widely regarded as 'inappropriate', as they fall outside the design concept that underpins the apparatus.

Nam June Paik's *Magnet TV* (1965), for instance, consists of a magnet attached to a cathode ray tube monitor.[3] It presupposes a sophisticated understanding on the artist's part of the device's internal operation. By demonstrating that the device affords alternative methods of making images, the artist declines to settle into the subject position of the compliant user.

The history of video art and (especially) experimental cinema is rich with examples of artists who refuse to be interpellated as users. Stan Brakhage's four-minute film *Mothlight* (1964), for instance, abandons the standard method of shooting moving images. The film was made by placing various leaves and insects between two layers of tape, which were then processed by a film printer.[4] Brakhage's actions can be viewed as acts of learning, whereby the filmmaker struggles to learn the possibilities that the thing can afford. This sort of work involves a search for alternative methods of input and/or output. Thus the use of the device is also a form of exploratory learning of the device. To rewrite the history of "new media" as the history of the formation of its black boxes also involves writing the history of changing modes of learning and discovery. The historical approach proposed here would therefore direct attention to the ways in which the repertoire, inventory, and composition of a black box are discovered, tested, debated, and rejected or stabilized. It would also describe in detail the ways technologies are taught and learnt, as well as the networks of dependency that arise through the presence of gatekeepers and spokespersons throughout the circuit of media production and distribution. This historical reconstruction is the principal task of a critical

media history informed by the theory of the black box.

(Endnotes)

1 A different edition is available online at: http://korotonomedya2.googlepages.com/VilemFlusser-TowardsAPhilosophyofPho.pdf

2 All subsequent citations from this report, which contains the basis of the so-called "von Neumann" architecture, will reference paragraphs rather than page numbers.

3 http://www.medienkunstnetz.de/works/magnet-tv/

4 A low-resolution video version of this work can be viewed online at http://www.youtube.com/watch?v=XaGh0D2NXCA. The full power of the work, however, can only be appreciated on celluloid.

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The Stage as Organism: Liveness, Dynamics and Expression in Early Twentieth Century Scenography

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Abstract The histories of liveness entwining theater and media technologies have traditionally emphasized the tension between the mediated (not real time) and the live (that which takes place in its moment of presence). These arguments have been well rehearsed, with performance studies scholars like Philip Auslander and Peggy Phelan debating the body's disappearance into Baudrillardian image simulacra to more recent studies who view electronic images as the central technology for performance. An alternative history that is largely unknown to new media scholars and practitioners, however, is that of theater scenography: the technological fusion of scenery, lighting, costumes and media which has been exemplified in the radical work of early 20th century artists like El Lissitzky, Moholy-Nagy, Kiesler, Tatlin, Svoboda and more recent projects from architects like Herzog/De Meuron and Coop Himmelb(l)au. This paper will survey the historical practices of three specific early twentieth century artists/designers (Vsevolod Meyerhold, Lyubov Popova and Frederick J. Kiesler) who sought not only to re-conceive the stage as hybrid machine and organism with the new technologies of their time but also have redefined liveness through the transformation and folding of the human performer into novel assemblies of mechanical and material expression; machines that exhibit behaviors and dynamics that, while ìlive,î are decidedly not human.

Keywords: performance, machine, biotechniques, organism, scenography

In his 1947 lecture ìMachine and Organism,î the French philosopher of science Georges Canguilhem passionately argued for a biological understanding of machines. ìNearly always, the organism has been explained on the basis of a preconceived idea of the structure and functioning of the machine; but only rarely have the structure and function of the organism been used to make the construction of the machine itself more understandableî (1992, 45). Unlike the machineís restricted degrees of freedom, uniform movement designed for ìpurposivenessî and ìstrict adherence to rational, economical rulesî (56), the functions in an organism are ìsubstitutable,î plastic and adaptable to the external environment. The organism is dynamic in that it is ìless bound by purposiveness and more open to potentialitiesî (58).

As both trained philosopher and physician, Canguilhemís argument aimed to reverse the wellaccepted Cartesian mechanistic weltanschauung. Biological organization could be seen as the ìbasis and necessary condition for the existence and purpose of a machineî (45). According to Canguilhem, ethnologists and anthropologists may be the ones to really understand the continuity between machines and organisms in their studies of how early tools and techniques operated on and transformed nature. Technical inventions are thus none other than potential extensions of ìhuman behaviors and life processesî into the natural environment (63).

Canguilhemís understanding of the technical is one imbued by dynamism and change. Unlike Cartesian mimicry, representation or reduction of human behavior and movement to pure mechanics in which ìevery aspect and every movementî can be represented and calculated a priori, the organism is subject to transformation; in short, to a living experience. ìLife is experience, meaning improvisationî (58). What is at stake for us in Canguilhemís argument is what philosopher Bernard Stiegler has labeled ìthe pursuit of the evolution of the living by other means than lifeî (Stiegler 1998, 135). Stiegler refers here to the essential technicity that lies at the core of all human existenceóa technicity that, despite its common understanding as rational and teleological outside of the forces of nature, can be seen as improvisatory and mutable in and through time.

From a cultural and artistic perspective, Canguilhemís understanding of the machine appears to forge a continuity between two of the twentieth centuryís key paradigms: the mechanical age ushered in by the explosion of industrial modernism at its start and the end of century shift towards the biotechnological. This paper examines the tension between these two epistemes through one specific site of artistic practice, namely the stage. In many ways, the theatrical stage is an ideal site for exploration since ontologically, the

theater has always been dealing with the tension between human performers and spectators and technical apparatuses that condition perception, sensation and experience. Indeed, machines on the stages of Greek, Roman, Byzantine or Renaissance European civilization all play transcendent and immanent roles simultaneously; human constructed devices and apparatuses that at the same time stand in for and embody forces beyond humans in the guise of God, nature or other entities. The deus ex machina, automata, the architecture of the Renaissance perspective stage that controls the eye and privileges the sovereignís (and hence, Godís) ideal point of view and increasingly, the silent, hidden forces of computation to control the interplay of multisensory media, all extend human technicity from the stage and into the world.

Despite this long history of human bodies meeting mechanical matter, many recent attempts to explore the historical relationship of new technologies to the stage have relied mainly on the framework of media representation (usually visual) as the central technological influence. In his oft-cited book Liveness: Performance in a Mediatized Culture, Performance Studies scholar Philip Auslander intimates that ìthe history of live performance is bound up with the history of recording mediaî (Auslander 1999, 58). The live is that which is brought to us in real time by technologies of recording and reproduction versus the mediated, which is not real time. Although Auslander recognizes that performance has both been occupied with technologies over its history, he claims it is ìonly since the advent of mechanical and electric technologies of recording and reproduction, however, that performance has been mediatizedî (1999, 58).

The ìliveî is that temporal manifestation at the moment of its occurrence which makes performance unique and singular. In this sense, one of the central things that technology in the guise of media brings to the stage is a confusion of presence, something that deeply haunts theater and performance scholars and artists. The famed Polish director and theorist Jerzy Grotowski once described a ìrich theaterî of technologies borrowed from film as ìnonsenseî (Grotowski 1968, 19). More recently, performance studiesí theorists like Peggy Phelan have also sought to defend theaterís unique ìmarkingî of human bodies against the encroachment of mediation. ìPerformance implies the real through the presence of living bodies,î writes Phelan, discounting the importance of other bodies; the dynamism of technics that play along side and with human bodies on the stage (Phelan 1993, 148).

This paper proposes an alternative examination of the relationship among technology, the stage and the history of media arts that is materialized in the practice of scenographyówhat Czech designer Josef Svoboda described as the fusion of dramatic action and stage time and space itself through the means of dynamic and kinematic scenery, lighting, costumes and media. My aim is to show through the work of three exemplary practitioners of machine age scenography, the Russian theater director Vsevolod Meyerhold, the Russian painter and scenographer Lyubov Popova and the Austrian architect and designer Frederick J. Kiesler, how the continuum between the mechanical and the organic that Canguilhem describes is articulated in these creatorsí approach to the stage as a hybrid machineorganism, a novel assembly of mechanical-material expressions. As the theoretical discourse and artistic practices of what constitutes ìlivenessî that increasingly permeate this conference and the history of the media arts in general shift away from questions of static representations, of code or image, and towards examining the interrelationships and interactions among the biotechnical, the organic, the ecological and the performative, I argue that we need to re-examine the technological histories of performance outside of the paradigm of ìmediatizationî (Baudrillard) to grasp their material enunciations and repercussions. In this sense, I propose a reading of the histories of new media and performance away from the technical image confronting a strictly human-subject and instead, an examination of the stage event as a dynamic, spatiotemporal act constituted through the co-production and interaction of both organic and inorganic subjectivities.

The Bio-Mechanical Stage: Meyerhold, Popova and Bioconstruction

It is well known that the machine age was embodied in the core avant-garde artistic movements of the early twentieth century like Cubism, Futurism and Constructivism. Of all of these artistic trends, however, historically it is Constructivism that has been viewed as the core aesthetic expression of the foment surrounding the dawning of socialism across Russia and other parts of Europe between 1917- 1933. Despite the fact that differing Constructivist principles were argued out among warring factions and spread across more than a half dozen disciplines ranging from theater, painting, typography, cinema, industrial design,

architecture, and sculpture, the movementís central tendencies gravitated around the unification of art, science and industry in service of a new world of socialist-driven progress and an integration of such cultural production into everyday life.

Within the imaginary and ìsyntheticî realm of theatrical performance, Constructivist creators viewed the stage as an ideal laboratory to test out social experiments within a totalized, artificially designed technological environment that would have proved impossible to recreate within the turbulent economic and socio-cultural urban environment of post October Russia. Embracing the birth of a new industrial age, the stage became a material re-imagining of socio-technical life with scenographic environments composed of skeletal frameworks of exposed wood and steel, freely suspended staircases and precipitously perched girders, hanging projection screens and searchlights, ladders, cranes and ramps, jungles of blinking displays, signs, posters, slogans and text, moving walls, wheels and gears, and, in some cases, real cars, motorcycles, and trucks.

Although many theatrical experiments from 1918ñ1928 featured such architectural tropes, the most radical originated in the work of Russian theater director Vsevolod Meyerhold. Arguably one of the most influential twentieth-century directors, Meyerholdís work from the period between 1919 and 1927 radically transformed stage performance. In 1913, Meyerhold already spoke of a cinefication of the theater ñ not by putting the cinema image on stage (projection technology was too crude in Russia at the time) but rather through the use of theatrical lighting and fluid, choreographed staging to create a dynamic event that would parallel the cameraís transformation of space and manipulation of time.1 Even though Meyerholdís productions already flirted with Constructivist principles already around 1920, it was not until his fabled 1923 production of The Magnanimous Cuckold, a nineteenth century boulevard farce from the Belgian playwright Ferdinand Crommelynck done in collaboration with the Constructivist painter Lyubov Popova, that the directorís technical-scientific transformation of the stage environment was ushered in at full force.

Popovaís stripped-down scenography for the play bid farewell to earlier illusionistic stage design, instead bypassing fake painted scenery and representational 2D surfaces and replacing them with a gigantic machine-like apparatus. Consisting of a labyrinth of ramps, steps, ladders, painted wheels with the words CR-ML-NCK (the authorís last name) that rotated by way of the actors and sails that at times appeared as windmill blades and at other times, as abstracted mechanized forms, Popovaís scenography resembled more of an installation than a typical theatrical set. While Popovaís functional, skeletal scenographic environment transformed the stage into a machine, Meyerholdís virtuoso actors who were trained in a technique the director labeled ìbiomechanics,î treated the environment as a something of a giant, expressionist play-space for their own physical inventiveness; a machine for acting .

A series of twenty rigorous études, biomechanics comprised a set of physical exercises that aimed to organize the kinesthetic machinery of the actorís body in close connection with musical principles such as rhythm, dynamics, and tempo while simultaneously developing his agility, coordination, and expression in relationship to other performers on stage. Derived from circus and commedia dellíArte vocabularies, exercises like running, ìshooting the bow,î ithe dagger attack,î ìslap on the face,î ithrowing a stoneî and other static and dynamic poses built up an awareness of the component parts of a gesture, the relationship to the center of gravity and stage space and a general level of physical stamina to bring the actor up to the position of dancer . More importantly, as a ìmethod of physical actions,î biomechanics brought the body into the role of expresser; ithe body as the producer of external wordî (Rudnitsky 1981, 296).

Historians have continually dwelled on biomechanicsí inspiration in the mechanization of the body taking place in Constructivist practices at the time as well as from the scientific management theories of the American psychologist Frederick Taylor, where a workerís body was subjected to indepth analysis of a given set of tasks around a particular set of jobs (cutting of metal, pig iron handling, bricklaying) in order to establish a given taxonomy of gestures that management could then teach workers in order to conserve bodily efficiency. Yet, within Meyerhold and Popovaís technoscenographic mise en scene, the tension between a technology external to the performerís body in its appearance and the machine as Canguilhemís ìextension of life processesî is rigorously played out. Popovaís scenography shapes the behavior of the performers by integrating them into the constraints of a machine while simultaneously the actors explode

the limited movement possibilities and predictable behaviors ìvirtuallyî contained within the apparatus through the irrational, improvisational dynamism of their own bodies. An economy of biological excess, of improvisation and adaptation, thwarts the simple assimilation of the body into the machine; a ìsubordination to the mechanical.î (Canguilhem 1992, 63). Instead, through Meyerholdís agile performers bouncing on and off of Popovaís static contraption, the mechanical becomes inscribed into the organic and the bodyís technicity is expressed in both the environment and in its improvisational possibilities; new creative material practices aimed at creating a new human being or what the Constructivists called life construction (Rudnitsky 1981, 294).

Frederick Kiesler: From Archi-Scenography to Biotechniques

The fact that Meyerhold and Popovaís machine vision can be said to harbor an underlying concept of the organism may strike one as strange, particularly since the scenography does not feature the ìsoftî visual hallmarks of biomorphic form at the level of its visual appearance. In his provocative article ìWhen Architecture Meets Biology,î architectural historian Detlef Mertins perceptively analyzes the strong interest that machine age artists/designers had with biological constructs through what he terms ìbio-constructivism;î the interest in a ìnew cosmology of world reconstructionî propagated by Constructivist architects, designers and scenographers like El Lissitzky, László Moholy-Nagy or even Mies van der Rohe who sought a new techno-scientific vision of man in relation to his environment (Mertins 2007, 115-117).

A key figure in this story is the Austrian trained architect, scenographer and designer Frederick J. Kiesler. Trained in architecture and painting in Vienna, Kiesler exploded onto the avant-garde scene in 1923 with an infamous electro-optical-mechanical scenography for Karl Capekís robot play R.U.R. in Berlin. As part of Kieslerís desire to destroy the legacy of ìpainting on the stage,î Kieslerís ìcontrol wallî consisted of a large contraption that covered the entire stage frame and whose surface consisted of a dizzying array of both painted and real objects: electrical machinery, metallic forms, doors and screens that opened, wheels and gears, measurements devices and other abstracted techno-emblems. The fixed ìelectro-mechanical scenery,î according to Kiesler, ìhas become alive, an active part in the play. De la nature morte vivante. The means to fill the stage with life are: movement of lines, sharp contrasts of colors, the transformation of surfaces towards reliefs and curved human formsî (Kiesler, n.d.). Indeed, Kiesler would already claim as early as 1932 that ìthe stage,î despite its mechanical glory, ìis a completely independent organism with its own theatrical laws of its timeî (Lesak 1988, 42).

It would not be until his emigration to the United States in 1926, however, that Kieslerís interest in the organization of biological form would increasingly shape his scenographic, design and thought practice. During his tenure as the head of the scene design department at the Juilliard School from 1934-1956, for example, Kiesler experimented with multi-screen projections, ìfigure-enlargingî costumes and more unusual geometric-biomorphic forms for stage objects. Even Kieslerís use of media in the form of film projection departed from the typical representation of images and towards the goal of creating a more dynamic stage environment that would co-evolve alongside the human performers.

It was also during this same period that Kiesler solidified his theories of ìbiotechniqueî through the establishment of the short lived Laboratory for Design Correlation at Columbia University where he worked on projects focused on a scientific approach to design. As described in the 1939 text ìOn Correalism and Biotechnique: A Definition and Test of a New Approach to Building Design,î correalism expressed ìthe dynamics of continual interaction between man and his natural and technological environments;î what Kiesler termed an ìexchange of interacting forces Ö and the science of its relationshipsî (Kiesler 2007, 68). Whereas for Kiesler the traditional architectural modernist notion of form follows function expressed an obsolete design formula where ìnew forms had been wrapped around conventional ways of living,î biotechnique would explore the manner in which the technological environment would ìdevelop the possibilities of specific actions contained in any nucleus of human physiologyî (76). Derived from the ìevolutionaryî and ìinventiveî potential of man, biotechnical design imagined a technological environment that would be a ìliving organismî by definition of it fulfilling human need. ìAnything of natureís creation which fulfills a need is a living organism. Every creation of manís technology is a living organism, whether it be a pillbox, a house or a motor (77). Components of the biotechnical environment would regulate the

human environment through an ìinterplay of action with one another and with nature.î Through its continual interaction between natural and artificial environments, technology thus would aim to develop ìnew functions within the old framework of what was considered human nature, sustained by inventionî (78).

Conclusion: The Animation of Matter

It is clear that Kieslerís scenographic practice was bound up in this broader conceptualization of the biotechnical forces expressed in the interaction loop among man, technology and nature. In artistic and design terms, Kiesler was already far ahead of his time in exploring the manner in which natural processes could extend into human practices through tools and techniques. Movement and animation, those characteristics by which we attribute whether something is ìaliveî is, according to Kiesler, ìchiefly the result of optical observationî (77).

ìAt what point does inanimate matter pass over and become alive?î wrote Kiesler in ìOn Correlation,î referring to a 1912 experiment in which cells from the heart of a developing baby chick were removed by Rockefeller Institute researchers and healthily grown and sustained inside the technically constructed environment of a test tube. ìThe experiment confirms the view that, while life only comes from life, it is also dependent on its technological environmentî (75). In Kieslerís view, the goal of biotechniques is indeed the bridging of two kinds of life: human and technical. ìFinding the bridge between man and artificial, man-built, technological environments must become the grand quest of future buildingî (75). In their examination of and practice constructing scenographic environments that challenged the concept of representation and fixity, Meyerhold, Popova, Kiesler and other early twentieth century scenographers thus paved the way for our current age in which new materials and matter changes shape, color and size and renders possible the potential for action in material form. Indeed, as our understanding of liveness becomes increasingly hybridized by our new twenty-first century technologies of ìlife construction,î Kieslerís formulation of biotechnical life will increasingly become more resonant.

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Notes 1 Meyerhold, along with German director Erwin Piscator, was among the earliest theater directors to integrate the cinema screen within three productions starting in 1923. Yet, cost and resource factors prohibited the director from ever using film in the way he imagined it. **Haunted profiles: *Social networking sites and the crisis of death***

Haunted profiles; social networking sites and the crisis of death.

Audrey Samson

ABSTRACT

How do perceptions of death shift or alter in relation to newly emerging technologies?

In this paper I look at examples of mourning rituals, namely online memorials using social networking sites, through the looking-glass of media theories such as 'Reflections on photography' in Roland Barthes' *La chambre Claire* and the spectral archive in Jacques Derrida's *Archive Fever: A Freudian Impression*. I locate these new conceptions in the context of the history of human perceptions of death as described by Philippe Ariès in *Essais sur l'histoire de la mort en Occident*. I look at these histories and conceptualizations, as expressed in changing media, as a way into the question of whether contemporary mourning rituals begin to insinuate a new tradition of mourning, and as a means to elucidate how the online applications these rituals are based upon and their uses enhance/flatten/affect our perceptions of death.

KEYWORDS

Spectre, social networking sites, archive, death, media

How is our mourning experience influenced by the alteration of human temporal experience by 'machinic' processes? [1] How do contemporary mourning rituals and media such as online memorials reflect the disjunction between computational and lived time? And more, do they serve to enhance our understanding of these time rifts?

As cemeteries moved from city centres to suburbs, burials to crematoriums, gravestones to anonymous forest and sea ash-dispersing ceremonies, and halls of memory from monuments to websites, memory itself migrated. Sándor Márai states in *Tagebücher 1984-1989* that there is no particular moment at which a person dies; rather, it happens in stages (quoted in Kunstmuseum Bern 2006, 41). We cannot still affirm that memory or even death is tied to a 'place', or a 'time'. Our movements, changing lifestyles and the speed of machinic processes affect the way in which we 'remember', mourn, perceive and represent the dead. We are consequently constantly developing a new system of symbols/rituals that reflect the changes in our perception and experience of death. How are these symbols and rituals represented in contemporary Western mourning culture and how do they fit into the tradition of mourning? In this paper I will contextualise these questions by looking at certain examples of the widespread use of online memorial sites such as Legacy.com and social networking sites such as MySpace as sites of mourning and memory.

The business of mourning

Historically, in the West, mourning has often been an economic affair; whether by the church, private funeral homes, or professional mourners, our emotions of loss have been capitalized upon in one form or another.[2] Therefore it makes sense to look at innovations in the capitalization of mourning for examples of what people accept/allow/need/want in order to mourn.[3] One such example is the online memorial site: Legacy.com. It is one of the largest, and it collaborates with big American newspapers to publish and update online guest books related to obituaries on a daily basis (Legacy.com). The small print that lies in the footer of the Legacy.com site states:

> Legacy.com and its newspaper affiliates publish obituaries for 2 of 3 people who die in the U.S. – updated continuously throughout each day – as well as government records for all U.S. deaths. Find an obituary, sign a Guest Book or build an interactive memorial. Get directions to a funeral home, order flowers or donate to charity. Read advice from experts or participate in online discussions. Thanks for visiting Legacy.com – Where life stories live on. We welcome your feedback.

For the mourner, the range of services is astounding. It is a portal linking to all possible mourning desires. The name of the company itself: Legacy.com, corresponds exactly to its URL, strongly indicating that

American mourners have already largely adopted the use of online memorial services and that the connotation of .com in relation to death is not a disturbing one. More interesting is perhaps the company slogan: 'Legacy.com – Where life stories live on'. The emphasis is on life, its continuation, and the seemingly 'eternal' affordances of the online medium. Though the Internet is inextricably linked to physical servers, cables, towers and satellite infrastructures, much of the popular discourse revolves around the idea of the 'ethereal' properties of the Internet.[4] Is the body-less idea of an eternal soul after death suited to the Internet medium? Is the Internet becoming a portal to the afterlife? The comfort appears to lie in the idea that the dead continue living online, or that they are always accessible there (as long as the user has online access). The notion of 'live-ness' is twofold on Legacy.com. Both the guestbook, which is constantly updated with new comments about the deceased, and the interactive memorial, suggest a dialogue with the deceased (though it is of course unidirectional). The possibility of that conversation is directly related to the user's accessibility to the Internet. Theoretically, it is possible at all times. The notion of death and finality does not appear to be included in such a business model.

> *Dans la vie de tous les jours, la mort, jadis si bavarde, si souvent représentée, a perdu toute positivité, elle n'est que le contraire ou l'envers de ce qui est réellement vu, connu, parlé.* (Ariès 1975, 196)
>
> (Death, which was in the past so talkative and so often represented in everyday life, has lost all positivity. It is but the contrary or the inverse of what is really seen, known, spoken off.) [author's translation]

History of the taboo

The individualization of the grave that has led to such innovations as the interactive memorial is a relatively modern concept. Philippe Ariès' research in *Essais sur l'histoire de la mort en Occident*[5] shows that during the better part of the Middle Ages, destiny was understood as a collective end: we all went to paradise at the end of time (Ariès 1975, 34). As such, individual graves were not known. Instead, bodies were lowered and then piled onto countless rotting bodies in collective burials (Ariès 1975, 25). Ariès explains that as the Last Judgment became an individual judgment (rather than a collective one) and that this judgment occurred at the moment of one's death (rather than at the end of time) the seeds of the individualization of 'death' were sown. Not only this, but the individuality of the Last Judgment is linked to the idea of an individual biography which unravels upon death, to be judged in terms of 'good' or 'bad'. The attitude of the soul being weighed is believed to be decisive in the outcome of the judgment, which confers death its 'dramatic' character (Ariès 1975, 37).[6] The dramatic nature of death is therefore in itself a modern concept linked to the individualisation of the Last Judgment. It becomes interesting to examine how the use of technology in everyday life might reflect this taboo of death as well as how these technologies can become a potential platform for judgment.

The role of social networking sites

Interesting and unforeseen examples have emerged from the so-called 'Web 2.0'. Such as the use of profile pages (in the case of MySpace) or group pages (in the case of Facebook) as online memorials for deceased individuals. Both MySpace and Facebook are now widely used as sites of mourning/memory.

It has, for example, become common that parents or friends of a deceased loved one will make a MySpace memorial profile page or setup a Facebook group in memoriam.[7] Some parents visit the memorial profile/page daily and report that it has helped them cope with the death (St. John 2006). An example of such a page is: Remember KrunkKindle (Figure 1).

Typically the site carries a profile picture of the deceased (usually depicting a typical characteristic of the person whether that is an action, a context or a facial expression). The site usually notes the time of the death (similarly to a gravestone), how the deceased died, and sometimes offers links to petition sites in cases involving disputed manslaughter, for instance. The personal details are filled in according to the preferences of the deceased (such as, Status: Single; Zodiac Sign: Gemini, etc). Photos are usually uploaded to the profile (those are mostly available to public view). The comments section is typically uploaded regularly during the weeks/months after the person has died. Thereafter, posts are made yearly around the time of

death and/or the person's birthday. These sites can receive comments by friends, family and even strangers up to three or four years after the person's death.[8]

In some cases, parents of friends who knew (or figured out) the password of the child's profile will access the existing profile. They may add the date of passage, a small R.I.P note to friends and family, use it as a central information dispatcher for funeral details, and even to access their child's mail between 'online friends'. Ironically, some parents have reported enjoying getting to know their deceased child better through the online network that she/he had built. The following testimony is compelling:

> We didn't understand the breadth and scope of the network she had built as an individual, and we got to see that through MySpace. It helped us to understand the impact she's had on other people (St. John 2006).

One's online network appears to signify the 'essence' of one's social being. Theorists such as Roland Barthes have associated 'Media' in these terms (as a sort of displaced interpretation of an event, emotion or even person that has occurred in the past), to the establishment of a desire to unravel its 'essence'. How does a collection of profiles lend itself to this desire? To assess whether social networking tools such as Facebook and MySpace are inscribed within this concept of Media, it is useful to apply Barthes's idea of the 'essence' of 'Photography' to online social networking sites.

The Essence

In *La chambre Claire*, Barthes attempts to discover the 'essence' of Photography by analysing various types of photos that touch (or 'punctuate') him personally. Interestingly enough, it is a photo of his dead mother depicted in her youth that comes the closest to exemplifying (for him) what he believes to be one of the two avenues now available/present in Photography, which he describes as 'the awakening of an ineffable reality' (Barthes 1980, 183).[9] Photography is 'pose', quite literally the light emanation of the referent (Barthes 1980, 126), the proof of a moment. It *is* what it represents, yet to develop a picture is to develop the 'un-developable', an essence which cannot be transformed, but can only repeat itself by the insisting *regard* (gaze) (Barthes 1980, 81). Barthes believes that Photography, by its very nature, lends itself to the disturbing search for the essence, without ever being able to afford its contemplation (since there is no essence in a photo, only pure referent) (Barthes 1980, 104).

An online network of 'friends' created through a social networking tool might be similar in that the collection of profiles suggests 'meaning', but it can only bear meaning through the collector him/herself and therefore cannot be contemplated as such. One can compare the parents daily sifting through their deceased daughter's profile comments and contacts to Barthes' insisting gaze onto his dead mother's photos.

Le Soldat Inconnu

Interestingly, not only do parents or friends setup memorial sites for their deceased loved ones but also complete strangers. Typically these will be created about a person who was killed or has disappeared, and the case is exceptional (and horrible) enough to have been widely circulated in the American media.[10] For example, at the time of writing this paper there were at least six MySpace memorial pages setup for Taylor Behl (MySpace).[11] Taylor Behl's mysterious disappearance was highly publicised, and apart from the many MySpace profiles dedicated to her there are also websites, and YouTube videos. Perhaps what is most interesting for this study is the text on one of the MySpace profiles dedicated to Taylor Behl called 'Beautiful Stranger'. It describes why the person decided to make a memorial page for her.

The following is an excerpt of the text under 'Info about myself':

> I made this myspace in honor of Taylor Behl's memory. I was very touched by her story and I understand how her friends and family feel. I was in a similar situation, and I sympathize. I prefer to stay anonymous because it doesn't really matter who I am because this is dedicated to her. I want everyone to post comments and write stuff to her on here. I'm gonna make this myspace similar to hers.

> And I know this site says she's in Chico and she's an aquarius, but she's not. I'm in Chico, and I'm an aquarius, and I just wanted to show, that I live all the way across the country, and i was so touched by her story that i would do this for her! I also graduated high school and went off to college when I was 17. I can relate to her in so many ways it's scary. But like I said, this site is not about me, it's about Taylor Behl! (MySpace Beautiful Stranger)

The testimony speaks of sympathy and more compellingly of identification with Taylor Behl's situation. The stranger's personal information is mixed in with Taylor's, such as the city and zodiac sign. The Beautiful Stranger profile comments section is loaded with spam and sporadic comments from friends (in real life?) and self-proclaimed strangers. There was a considerable amount of effort by 'the stranger' to customize the site and add presumably self-made 'in memoriam' artwork. The stranger alludes to his/her own situation without giving away the crucial information. Spam in the comments section denotes the site has long since been desisted (which is also shown by the Last login: 11-4-2007 mention). The sparse messages from presumably 'real' friends commenting amongst this spam on a page desisted by its owner, brings an eerie feeling to the visitor. In this case not only is Taylor Behl (the subject of the profile) dead but we are left to wonder if the stranger might be as well. Friends and supporters of Taylor continue to comment on this page as if the stranger who built the page was as insignificant as he/she declares in the 'Info about myself' section. A spectre of a spectre?

The spectral archive

Derrida's notion of the spectral archive can also be useful to address the previous question. In 'Archive Fever' a seminal text addressing the function of memory in relation to techniques of reproduction, Derrida explains that the truth is spectral (Derrida 1995, 87). In visiting the Beautiful Stranger profile we are not only being haunted by the spectre of the repressed truth (the mystery surrounding Taylor's death) but also by the spectre of the 'stranger' and the secrecy surrounding him/her/it. Though the site seems desisted by its creator, we are haunted by the stranger's possible return. This possibility created in our minds resists explanation like the spectral truth of delusion described by Derrida (Derrida 1995, 87).[12] To some extent any MySpace profile of a dead person could constitute a spectral archive, as it is 'a trace always referring to another whose eyes can never be met' (Derrida 1995, 84). However, profile pages remain the graphical representation (and to a certain extent the interface) of a database. It would be interesting to explore what possible notions of 'spectrality' could be defined in relation to a digital database and how this might be thought of in terms of profiles such as Beautiful Stranger. This prompts a further question: what do we call the ghost of a ghost?

"La mesure de la mesure nous manque" (Derrida 1993, 129)

Hallucination folle

In many cases the deceased person's friends or family do not access the MySpace or Facebook account (particularly if the username/password were not known by anyone else). In these instances, the profile itself looms like a ghost, unchanged, and will remain as such.[13] However 'friends' can still add to the comments section (it can also be hacked by spam bots of course). One such example is Dallas' profile (MySpace Dallas). His profile page acts like a kind of digital tombstone. It shows the profile name, Dallas, with a picture of him on a motorcycle and the following info:

> Hello! I'm Dallas!
> Man
> 27 years old
> ORANGE, CALIFORNIA
> United States
> Last login: 17-10-2005 (MySpace Dallas)

The last login is usually exactly or very close to the time of death.[14] The age however keeps changing year after year because the MySpace account 'cannot compute' death as it works with the initially entered date of birth of the user and there is no 'time of death' entry possible. Dallas' profile shows a combination of

a ‘frozen moment in time’ (the profile as it was left at the moment of the last login) and Dallas’ ‘spectral aging’. Do ghosts age? What is this ‘27 years old’ but an attestation of his continuity, both in the memory of those who knew him and also in the digital memory of the MySpace servers. Ironically Dallas’ digital spectre is infinitely bound to the physical. If the server containing his data were to be destroyed, not only would the aging process stop, but the profile altogether would disappear and one would find: 404 Error File not Found.[15] If we may indeed refer to such profile pages as spectres, it is interesting to note that their spectral qualities are bound to the physical data storage device and the functionalities of the database in which they are stored.

The only other aspect of the profile that accumulates new data is, as mentioned, the comments section. Below is a screenshot showing comments made to Dallas on his birthday (three years after his death).

Remarkably, the comments on his profile are mostly addressed *to* him, rather than talking *about* him in the fashion of a eulogy. The comments, full of messages addressed to his ‘dead self’ make an eerie combination reminiscent of Barthes’ description of Photography as a form of hallucination, confusing the real and the living.[16] Could these profiles be a form of digital *hallucination folle* that rather confuse the living and the archive? The real in this case is substituted by an archive of instances (comments, photos), which can no longer necessarily even be linked to the ‘real’. It is common for example that people create several profiles acting under several aliases deliberately never referring to their identity ‘in real life’ or that actual bots (computer programs) create profiles. The fictional identities or those created by an automated script constitute fragments of an archive that cannot be reconciled under the notion of ‘the real’. Not only is the archive confused with the living but also with elements that are programmed by humans and put into effect by code. Thus the functionalities of automation partially determine our hallucination.

The Confessional

It is interesting to note that this *hallucination folle* manifests itself differently in publicly accessible platforms such as mydeadspace.com and Legacy.com.[17] As we saw in the example of Dallas, comments are addressed *to* the dead person (rather than talking *about* them which is much more common on publicly accessible platforms). In some cases the comments addressing the dead person resemble a confession. The MySpace profile page becomes reminiscent of the catholic confession booth. A few such examples are depicted in Figure 4.

The profile is usually public (viewable by ‘all’), yet the tone of the confession is secretive, uncertain and perhaps even guilt ridden. Though the perceived anonymity in which the person is typing his/her comment might facilitate the ‘public’ confession, the disjunction between the secret tone of the confession and the public nature of platform is unsettling. It seemingly desecrates the sacred by broadcasting what could be an *entretien* with God. As opposed to reality TV actors exposing their deepest darkest secrets to the viewers and bloggers recounting the minute intimate details of their lives in their posts, these confessors do not even appear to address ‘the masses’. They address an entity from beyond the realm of the living, endowed with a divine quality—the power of absolution and omnipresence.

The Public Square

On sites like mydeathspace, a site that post news articles and hosts MySpace member obituaries, the discussion forums related to the articles are reminiscent of the public square. The ‘inhabitants’ judge, accuse, defend and denounce the deceased (and persons which might be involved in the cause of death).

The populist nature of the semantics also facilitates persecution. For example, a person accused of manslaughter could be filed under ‘murderer’.

Forums like those on mydeathspace become a place of judgement and persecution. It would be interesting to survey to what degree common consensus develops throughout the post archives, and how the delayed and dislocated nature of the responses and its users affects this dynamic. Notably, Legacy.com spends at least 30 percent of its budget to filter out inappropriate comments in the guest books (Urbina 2006). The

comments that are screened allude to or directly accuse the deceased of infidelity, neglect, molestation, etc. The following are two examples of such comments:

> I sincerely hope the Lord has more mercy on him than he had on me during my years reporting to him at the Welfare Department.
>
> She never took the time to meet me, but I understand she was a wonderful grandmother to her other grandchildren.
> (Urbina 2006)

Though these comments never appear to the public (they are held in a moderation queue till they are approved), it seems to indicate a desire for 'public' persecution in the perceived anonymity of the online forum.

Conclusion

The widespread and various uses of web based social networking services as sites of mourning and memory show that the Internet is an accepted and adopted space of mourning. It therefore becomes a crucial point of interest in the study of contemporary mourning practices and the cultural acceptance of death (or lack thereof) in relation to media practices. Such uses as have been discussed in this essay suggest the Internet as medium to the afterlife; its roaming souls are channelled through profiles and guestbooks. Commercially available 'interactive memorials' suggest a possibility of a dialogue with the deceased similar to that of the comment sections in MySpace and Facebook memorial profiles. Have we reached a crisis of death? Both Barthes (1980) and Ariès (1975) refer to *la crise de la mort* (the crisis of death) when referring to the contemporary situation regarding society's perception of death, thus drawing an anthropological link between Death and the 'new image'. What kind of perspective codes do social networking tools such as Facebook or MySpace define? Online networks such as those built through MySpace lend themselves to the search of an 'essence' that becomes an insisting gaze upon and related to the represented profile identity, though, as in the case of Barthes' mother's photos, the essence can never be uncovered. Has the search however now shifted from the person essence to that of its ghost? Memorial profiles such as that of Dallas and Remember KrunkKindle present themselves as spectral archives but how can this notion be expanded to include cases like Beautiful Stranger and its layers of self-referring spectres? The eerie atmosphere of memorial sites is not only due to haunted spectres and the modern taboo of death but also the confrontation with a sort of *hallucination folle*: in this case the confusion lies between the archive and the living. Interestingly, the technical and physical capabilities of the archive (database) shape our *hallucination*. How it is programmed and how long the data physically exists determines the aging spectre of Dallas, for example. Our digital ghosts seem more bound to physicality than our 'pre-digital' ghosts ever were. The living eventually migrate to a mode of existence bound to database archives to which the word 'dead' is not even associated.[18] Mydeathspace.com, afterlife for the deceased's MySpace profile, symbolises the 'shift to the afterlife' by a metaphorical database data transfer, as well as providing a space of persecution and consensus similar to that of the public square. In addition, the confessional nature of some of the comments on these forums is blurring the boundaries of the public and the divine domains. Is the afterlife transgressing the physicality and space of the living online and/or does media and its uses slowly efface notions of finality altogether?

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Endnotes

1. I am referring to the definition of machinic processes in Mark B.N. Hansen's discussion about Stephanie Strickland's analysis of Web-based hypermedia in *New Philosophy for New Media*.

2 Ariès gives many examples occurring (at different moments) during the Middle Ages: the Church charging for the bodies disposed in collective burial grounds within the Church grounds, later for the ceremonies and for the binding of the testament (to ensure a place in heaven).

3 It is not the place here to enter into the discussion of what is imposed onto society and what is actually developed as a direct relation to its needs (rather than cultivated desires).

4 For examples of such discourse (and critique of it), see John Perry Barlow's 'A Declaration of the Independence of Cyberspace', Fred Turner's 'From Counterculture to Cyberculture', Richard Barbrook and Andy Cameron's 'The Californian Ideology'.

5 The scope is limited to Western graveyards belonging to the Christian faith.

6 This occurs primarily in the XIVth and XVth century.

7 The deceased usually had a MySpace or Facebook profile but not always such as in the case of young infants that would have been too young to have an account. Though one can easily imagine a new Facebook 'pregnancy' function that would automatically create a profile for the eventual newborn. Also, if the parents and friends of the deceased commonly use Facebook for example, though the deceased might not have, they will set up a Facebook group for this person.

8 MySpace was launched in August 2003. The amount of years the sites are visited and commented on will undoubtedly increase as years go by.

9 The other is the 'civilized codification of perfect illusions', and refers to a domestication and vulgarization of the 'photo', or Photography as an object for consumption, a vein which is not useful to elaborate upon here (Barthes 1980: 180).

10 My research into the use of MySpace memorial profiles has been narrowed to the U.S. as most of its users are American.

11 Profile pages devoted to Taylor Behl:

http://profile.myspace.com/index.cfm?fuseaction=user.viewProfile&friendID=59351944
http://profile.myspace.com/index.cfm?fuseaction=user.viewProfile&friendID=34137127
http://profile.myspace.com/index.cfm?fuseaction=user.viewProfile&friendID=33325432
http://profile.myspace.com/index.cfm?fuseaction=user.viewProfile&friendID=32689410
http://profile.myspace.com/index.cfm?fuseaction=user.viewProfile&friendID=32478215
http://profile.myspace.com/index.cfm?fuseaction=user.viewProfile&friendID=29758104

12 Derrida is elaborating upon Freud's notion of *truth of delusion*.

13 This is all the more true since MySpace accounts are never deleted, even when an account is specifically deleted, or said to be deleted.

14 Dallas died on October 19th 2005, two days after the last login.

15 Of course if the HTML file (of Dallas' profile) was copied and saved locally, that instance could be reproduced. However the functionality (such as aging and adding comments) linked to the databases is lost and it becomes another 'frozen moment in time'.

16 I specifically feel that the comparison with a hallucination is appropriate since, thus far, it has been considered 'crazy' or of the paranormal to speak *to* the dead publicly.

17 MySpace profiles can only be commented on by 'friends' (which must be accepted by the profile author) and Facebook groups can be made private. However anyone can comment on mydeathspace.com discussions and Legacy.com guest books.

18 It was not possible in the scope of the essay to address issues such as Terms of Agreements relating to social networking sites which tellingly have no explicit policy to deal with death but have strict archiving policies (that is, 'all your data belong to us').

Telematic Practice and Research Discourses: Three practice-based research project case studies

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Introduction

This Paper focuses on the production, documentation and preservation of the authors telematic practice-based research in the interactive media arts. This reflects a timely practice review with significant implications on the future of exhibiting and archiving the broad range of creative arts in this field. These fundamental research questions also have relevance across a number of practice based research fields including performance arts and the ephemeral nature of open-system interactive artworks. The objective of this paper is to propose research methods that will approach the question of how to accurately document and archive this transient creative practice that is so often reliant on its cultural and historic context. Since the early 90s my artistic practice has identified and questioned the notions of embodiment and disembodiment in relation to the interacting performer in telematic and telepresent art installations. At what point is the performer embodying the virtual performer in front of them? And have they therefore become disembodied by doing so? A number of interactive telematic artworks will be looked at in detail during this paper establishing case-study examples to answer these questions. Stemming from Kit Galloway and Sherrie Rabinowitz seminal work 'Hole-in-Space' to ----------'s telepresent experiments with 'Telematic Dreaming' and to the current emerging creative/critical discourse in 'Second Life' that polarizes fundamental existential questions concerning identity, the self, the ego and the (dis)embodied avatar.

The preservation and documentation of this work is extremely problematic when we consider the innate issues of (dis)embodiment in relation to presence and intimacy, as experienced and performed in telematic and virtual environments. How can it become possible to reencounter a performance of dispersed and expanded bodies, multiple and interconnected identities, spectral representations and auras; in short, at hybrid bodies (/selves) made of flesh and digital technologies, and the intimate connections between them.

Telematic Practice

My work in the field of telematic arts explores the emergence of a user-determined narrative by bringing remote participants together in a shared telepresent environment. Through the use of live chroma-keying and videoconferencing technology, two public rooms or installations and their audiences are joined in a virtual duplicate that turns into a mutual, visual space of activity. Linked via an H.323 Internet videoconference connection, this form of immersive interactive exchange can be established between almost any two locations in the world.

The audiences form an integral part within these telematic experiments, which simply wouldn't function without their presence and participation. Initially the viewers seem to enter a passive space, but they are instantly thrown into the performer role by discovering their own body-double in communication with another physically remote user on video monitors in front of them. They usually adapt to the situation quickly and start controlling and choreographing their human avatar. Nevertheless, the installation set up in the form of an open accessible platform offers a second choice of engagement: the passive mode of just observing the public action, which often appears to be a well-rehearsed piece of drama confidently played out by actors. Compelling to watch, it can be a complex issue to discover that the performers are also part of the audience and are merely engaging in a role. The entire installation space then represents two dynamic dramatic functions: the players, controllers, or puppeteers of their own avatar, absorbed by the performing role; and the off-camera members of the audience, who are themselves awaiting the next available slot on the telematic stage, soon to be sharing this split dynamic. However, the episodes that unfold are not only determined by the participants, but by the given dramatic context. As an artist I am both designer of the environment and therefore 'director' of the narrative, which I determine through the social and political milieu that I choose to play out in these telepresent encounters.

HEADROOM – A space between presence and absence (2006)

This case study represents the first theoretical account of 'HEADROOM'[1], a site-specific interactive art installation produced by Paul Sermon in Taipei as the successful recipient of the 2006 Taiwan Visiting Arts Fellowship. This residency programme was a joint initiative between Visiting Arts, the Council for Cultural Affairs Taiwan, British Council Taipei and Arts Council England. The development of this interactive art installation has been extensively documented as part of the AHRC Performing-Presence project[2] led by Prof. Nick Kaye from Exeter University in partnership with Stanford University. HEADROOM was exhibited at Xinyi Assembly Hall Taipei, April 2006.

HEADROOM is a juxtaposition of the artist's ethnographic research experiences in Taipei, between the way people 'live' and the ways people 'escape' this city, as an analogy between the solitude presence of the 'bedroom' (private) space and the social networking telepresent aspirations of the 'headroom' (Internet) space. Also referencing Roy Ascott's essay, 'Is There Love in the Telematic Embrace?' (1990)[3], and reminiscent of Nam June Paik's early TV-Buddha installations[4], HEADROOM is a reflection of the self within the telepresent space, as both the viewer and performer. The television 'screen' is transformed into a stage or portal between the causes and effects that simultaneously take place in the minds of the solitary viewers. The installation overtly intertwines private and public space, and the sense of the 'inside' and 'outside' of the installation's 'place'[5]. It is partly in this breaking down of oppositions that the participants' sense of the 'presence' of their co-performers is amplified. In this aspect, HEADROOM radically extends a disruption of oppositions in which video art/installation and site-specific work has frequently operated. The co-performers discover themselves acting out a series of intertwinings of public/private, inside/outside. The installation itself and title emphasize the intimate nature of this overlaying of spaces - the aspect of fantasy or dream - while the public nature of the installation sanctions or appears to give permission or consent to this closeness. In this context, co-performers discover themselves 'coming closer' in a paradoxical distribution of presence - an intimacy produced by a telepresent distance. Here, then, visitors discover themselves occupying and acting out their co-performer's private space, while seeing their own private space acted out by their telepresent partner. The spatial rules of public interaction are breached, producing an intimacy, a particular and shocking closeness, and a dialectic between the explicit sense of being here (in the bedroom, for example) and being there (acting out the space of the other), while seeing and responding to their co-performer's mirrored reaction.

Located in the east of Taipei city in the shadow of the 101 Tower and Taipei's World Trade Centre is a Taiwanese War Veterans housing complex built around 1949. This site has been renovated and converted into a museum and exhibition space. It sits on some of the most commercially sought after space in the city, but because of its historical importance to the liberation of Taiwan it remains a listed building. The back-to-back terraced streets have been knocked through into entire buildings, creating three large exhibition halls that retain their original appearance of the houses on the outside. The spaces that interested me most were the small facade rooms created by the larger space conversion, which have been separated from the gallery space by interior glass walls and are only accessible from existing external front doors. The two facade rooms I used for the installation were identical in size and were used to house a connected telepresent installation where the audience participants in the separate facade rooms where unable see each other. However this allowed the audience inside the gallery to observe both participants in the space through the glass walls. The rooms where only about 2 meters by 3.5 meters wide, and 2.5 meters high. The original houses were longer, but no wider and the original inhabitants often halved the height of the rooms to create separate sleeping and living areas. This two level use of the space interested me, and also reminded me of the outside of the space with the 101 Tower in stark contrast to the little houses huddled around its base. This paradox can be seen in much of Taipei's culture, from very basic noodle bars and soup kitchens between Karaoke TV clubs, 7/11 convenience stores, high-rise office blocks to countless temples devoted countless incarnations of the Buddha.

The project functioned by combining the two identical room installations within the same video image via simple videoconference techniques. The system worked as follows: The two rooms both had false ceilings lowered to a level of approximately 1.5 meters, which left a cavity space above each room of approximately 1 meter high and forced the gallery visitors to bend down when entering the spaces. However there was one

location in each room where the viewer was able to stand up straight and put their head and hands through a hole in the false ceiling and into the cavity space above. Although each room shared identical dimensions they had a strikingly different appearance. One of the rooms contained drab used furniture in the lower part with a very lived-in appearance, the cavity space above it was brightly decorated, appearing to be a personal shrine or Karaoke bar containing a large video screen at one end. The other room by contrast, was empty in the lower section and very bright in the cavity above, including illuminated blue walls and another large video screen. A video camera in each space recorded a live image of the head and hands of each participant and feed it directly to a video chroma-key mixer. The background in the profile head shot recorded against the bright blue walls was extracted by the video mixer and replaced with the other live profile head shot - placing the two heads opposite each other within the same live video image, as in fig. 1.

The red room represented a very theatrical, illusionary space. The blue room, by contrast, appeared to be a more functional back stage space. However, from the outside point of view there was not so much a front and back stage division as a juxtaposition of two entirely separate spaces, which, due to their sheer proximity, where meant to have something in common and yet, somehow, they never become a telepresent synthesis. For Gabriella Giannachi[6] there is a post-modern dialectic here, expressed visually in the impossibility of the two spaces to become one. That the external viewer, standing in front of the two spaces, actually sees 'nothing' but the real, whereas to see the telepresent space you actually have to be willing to be within it.

Liberate your Avatar (2007)

Since May 2007 my practice and research has undergone what might appear to be a paradigm shift, focusing on the creative possibilities of the on-line multi-user virtual environment of 'Second Life". Whilst this represents a major departure from my established telematic projects, there are significant parallels between the earlier telematic video experiments and the presences and absence experiments he is currently developing in Second life. Together these aspects of telepresence and the merger of first and Second Life aim to question fundamental assumptions of the Second Life phenomena.

The aim of this project is to critically investigate how online participants in three-dimensional worlds, Second Life in particular, socially interact within innovative creative environments and appropriate these cultural experiences as part of their everyday lives, and question what is 'real' in this relationship. The project brings together ethnographic and creative practice-based methods that identify and develop original and innovative interactive applications, interface design and imperative cultural and sociological knowledge that will help shape and define the emerging online society and 'metaverse'[7] of Second Life, significantly contributing to the quality of both 'first' and Second Life.

In Second Life you create an avatar that lives out an online existence. There are no set objectives, you can buy property, clothing, accessories, furnish your home, modify your identity, and interact with other users. This online community has grown to eleven million residents since launching in 2000, generating a thriving economy. However, whilst the virtual shopping malls, nightclubs, bars and beaches often reach their user capacity, there is a noticeable lack of creative and sociological modes of attraction and consequently the growing media attention around Second Life warns that this expanding community has become ambivalent and numbed by their virtual consumption and there is an increasing need to identify new forms of interaction, creativity, cultural production and sociability.

However, when the 'Front National', the far right French political party of Jean-Marie Le Pen opened their Second Life headquarters in January 2007, the Second Life residents reacted in a way that would suggest they are far from complacent avatars wandering around a virtual landscape and that they possess a far greater degree of social conscience than the consumer aesthetics of Second Life suggests. Through prolonged mass virtual protest the centre was raised to the ground in the space of a week and has not returned since. The reaction to the Le Pen Second Life office begs the question: is Second Life a platform for potential social and cultural change? And is there a hidden desire and ambition to interact and engage with this online community at an intellectual and creative level that transcends the collective 'I shop therefore I am'[8] apparentness of its community? Moreover, does Second Life influence first lives? And therefore could

our first life existence start to reflect our Second Life conscience as this community continues to grow and develop into the future? As the landmass and population of Second Life expands at an ever-increasing rate it is clear that essential research into the intersection and interplay between first and Second Life, and both new and old patterns of consumption, cultural production and sociability is urgently needed.

This second case study focuses on some of my most recent Second Life experiments entitled 'Liberate your Avatar'[9]. An interactive public video art performance incorporating Second Life users in a real life environment, as shown in fig 2. Located on All Saints Gardens, Oxford Road, Manchester, for the Urban Screens Festival, October 12th 2007 from 5pm to 6pm, this installation merged the realities of 'All Saints Gardens' on Oxford Road with its online three-dimensional counterpart in 'Second Life', and for the first time allowed 'first life' visitors and 'second life' avatars to coexist and share the same park bench in a live interactive public video installation. By entering into this feedback loop through a portal between these two parallel worlds this event exposed the identity paradox in Second Life.

This unique project, commissioned by Lets Go Global Manchester, brought together previous practice-based telepresence research projects with current experiments and experiences in the online three-dimensional world of Second Life. The installation investigated the notion of demonstration and how it has been transposed from the real into the virtual environment. 'Liberate your Avatar' exposed the history of 'All Saints Gardens'; relocating Mancunian Suffragette Emmeline Pankhurst as an avatar within Second Life, where she remained locked to the railings of the park, just as she did 100 years ago, reminding us of the need to continually evaluate our role in this new online digital society. 'Liberate Your Avatar' examined this new crisis whilst drawing upon the history of the site, creating a rich, provoking and entirely innovative, interactive experience.

The installation consisted of three specific spaces, two of which were located in the virtual world of Second Life and the other one in the actual All Saints Gardens on Oxford Road, Manchester. The two virtual environments included a blue box studio and a three-dimensional replica of the All Saints Gardens, and are located adjacent to each other, allowing the Second Life avatars to move freely between the two spaces. When an avatar entered the blue box space their image became chroma-keyed with a live video image from the real 'All Saints Gardens'. This combined live video image of the avatar in the actual square was then streamed back onto the Internet and presented on a virtual screen in both Second Life spaces. An image of the Second Life version of 'All Saints Gardens' with its virtual 'big screen' was then presented on the actual public video screen in the real life 'All Saints Gardens'.

The outcome of this project identified a need to critically investigate how online participants in three-dimensional worlds, Second Life in particular, interact within innovative creative environments and appropriate these cultural experiences as part of their everyday lives as a vehicle for social and cultural change. Liberate your Avatar brought together theoretical and practical methods from the field to address this identity crisis in first and SecondLife. Although online communities have been studied in-depth for sometime now, the focus here will be upon an ethnographic, multidisciplinary and practice-based discussion in order to paint a richer picture of future experiences.

In this respect the project uncovered more question than answers, principally concerning identity and self. The ontological questions of virtual reality and identity, be it online or offline, have been at the centre of the contemporary media arts and science debate for the past three decades, Liberate your Avatar points at the social, political and cultural significance of Second Life by questioning the emerging relationship between 'first' and Second Life as a platform for potential social and cultural change - which is potentially appropriated as a mirror image of first life? Through this discourse the project questioned whether Second Life is a reflection of a first life or if first life is actually a reflection of Second Life? By consciously deciding to refer to this mirrored image as "first" life rather than "real" life, this central question polarized a paradox in Second Life when we consider Lacan's[10] proposition that the "self" (or ego) is a formulation of our own body image reflected in the mirror "stage". However, there are no mirrors in Second Life, which raises the fundamental question of whether it is possible to formulate our second self (or alter ego) in Second Life at all. Or is the computer screen itself the very mirror we are looking at?

Hidden Voices: Memoryscape (2006)

The final case study project 'Hidden Voices: Memoryscape'[11] was Commissioned by the Taipei City Department of Cultural Affairs for The 4th City on the Move Art Festival, November 2006, Taipei, Taiwan: From Encounter to Encounter - Expounding the Playground, which took place at the Children's Recreation Centre Taipei. 'Hidden Voices: Memoryscape' invited visitors to enter the amusement park and, guided by PDA's and maps, to randomly search out stories taking place amidst the physical terrain for example, unusual past experiences of different people at the amusement park when they were children: "a strawberry ice cream dripping on an orange skirt, a lost shoe, falling over and grazing a knee or how the space appeared then..." Stories and incidental experiences allow adults to reinterpret this place, which is the "territory of children", while memories in synch with the archetypal concept of the venue induce the expansion of the subconscious, constructing an aesthetic of imagined memories in relation to the venue. Thus, the augmentation of individual memories is transformed into collective memory. In addition to the augmented mediascape, ---------- presented a series of video projected images in the tunnel of the miniature train ride. These video sequences referred to a momentary transition between the past and present experience of the amusement park and thus further assisted in augmenting the participants journey around the environment.

This project commenced by interviewing parents and visitors at the adventure playground over a one week period and recording two to five minute episodes about their own childhood experiences and memories of the adventure playground. Intimate personal stories and strange and unusual memories about incidental experiences. In order to create this dynamic audio and video narrative the work was partly constructed/ dramatised and partly real life stories/interviews.

This layering of augmented memories over the actually experience of visiting the adventure playground today was further assisted by providing visitors with a map that guided them through the locations and stories attached to them. Whilst further conceptual information was provided in this guide, other discreet and unusual sounds and visuals were included that the user stumbled across, providing an abstract story or chain of events that brought the piece together within an interactive experience of a collective memory of the playground. The audio sequences were recorded using binaural microphones which spatially placed the sounds as they were when recorded. Additional visual references to this augmented narrative were provided as video clips projected in the interior of the tunnel of the children's train ride. A combination of slow motion and strobe flashing image sequences took the visitor further into this augmented memoryscape, a momentary return to the history and collective memory of the environment.

Augmented reality involves the overlaying of digital information onto real space. By moving through the real environment users experience the digital information at the location to which it refers. Headphones are connected to a small HP computer, called an iPAQ (PDA), that plays the appropriate sound file depending on where they are in the playground. Their location is determined by a GPS (Global Positioning System) receiver unit attached to the iPAQ. GPS is a worldwide radio navigation system that uses satellites to calculate your position. A GPS receiver needs visibility of at least three satellites orbiting the earth to get a good position reading. Sound and video sequences are defined how to play according to a software authoring tool. The authoring tool uses a map of the area as a background onto which regions are drawn. Specific commands are associated with each region and define what the user should experience when they enter or re-enter the space, and a client program running on the iPAQ works out which sound file should be played depending on where you are in the region. Software development by HP Labs Bristol. Supported by The University of Salford UK with financial assistance from Arts Council England and the British Council Taipei.

NOTES

1 Artists web site and documentation *http://www.paulsermon.org/headroom/*

2 AHRC Performing-Presence project. *http://presence.stanford.edu:3455/Collaboratory/500*

3 Ascott, Roy. 2003. *Telematic Embrace.* Berkeley: University of California Press, pp. 232-246.

4 Nam June Paik's TV-Buddha. *http://www.medienkunstnetz.de/works/tv-buddha/*

5 Kaye, Nick. 2000. *Site-Specific Art: Performance, Place, Documentation.* London: Routledge.

6 Gabriella Giannachi *http://presence.stanford.edu:3455/Collaboratory/500*

7 *The term **metaverse** comes from Neal Stephenson's 1992 classic science fiction novel 'Snow Crash', and is now widely used to describe the vision behind current work on fully immersive 3D virtual spaces.*

8 *The term **I shop therefore I am** was used by artist Barbara Kruger in 1998 as a pun on consumerism and René Descartes' statement 'I think therefore I am'.*

9 Artists web site and documentation *http:// www.paulsermon.org/liberate/*

10 Jacques Lacan, "The Mirror Stage," in Jacques Lacan, *Écrits,* (Paris: Éditions du Seuil, 1966).

11 Artists web site and documentation *http://www.paulsermon.org/playground/*

Abandon Normal Devices – they don't seem to work.

Mike Stubbs
FACT Foundation for Art and Creative Technology

This institutional presentation of recent FACT programs including Human Futures. Climate for Change and Abandon Normal Devices (AND Festival), new forms of Cultural Leadership will be explored. This will also be an opportunity to outline plans for the next Re Conference, Re:Wire, which is being proposed for Liverpool in 2011, asking questions such as:

How can lessons learned from tactics in converged new media be shared in building strategies of cultural leadership ?

How can we prove the importance of media art and new media histories in relation to a contemporary explosion within digital and networked economies and society ?

How can these histories be positioned to re-claim their significance along with pioneering practices and practicioners ?

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In the struggle to conceptualise, communicate and compare our perceptions we have invented new forms of language, visualizations, and nowhere more so than at FACT, (The Foundation of Art and Creative Technology). How can we continue to create scenarios to continue the development of the pioneering work within new media art, and build on this history to support ad hoc practice, the value of collaboration and new methods of organization and leadership?

Over 20 years, facts have become less definitive and increasingly speculative. In that period have we become less certain of the future or is it that modernism and the promise of 'progress' has not always come up trumps? Most versions of science fiction and futurism turn out to be a bit dumb. Facebook and Twitter (by the time you read this will they sound quaint and old hat?) maybe the dull and ubiquitous manifestations of collective intelligence. And with even speedier methods of comparing information and views, how does this account for perceptive bias and diversity of culture? With this in mind it is not possible to compare perceptions across time and generalize about 'one' world. My grandfather related stories of deepest, darkest Africa, the Amazon and shrunken heads. Bread and jam was the shadow of rationing and post war Britain needed hope. And as a product of that time, I have been privileged to film in zero gravity, and am planning an artists' residency program on the moon, the unimaginable really did get closer.

Our own view of the world has radically shifted not only terms of what we know – but how we know. The world went non-linear, not just analogue video editing being replaced by AVID (Hoover of the editing world). As we have witnessed a plethora of U-Tube explosions, distributed models of production and exhibition, and every conceivable variation between, artists no longer have the monopoly on creativity. Collaborative practice, cheap accessible tools and skills have enabled new models of research and practice to flourish. Perhaps non better cited than our own housing arts health community TV station Tenantspin, where people of different ages and backgrounds have been making their own media for 11 years, as producers and audiences exploring compelling new relationships. Our own media is only as good as our own experience, whatever our relationship to the world, this is what we carry.
With perceptions of broadcast and narrowcast, time and space up ended, entire systems of belief and dogma have tumbled.

Not only is this the year that FACT is 20, but also the year marking 20 years since the Berlin wall fell. Bastions of traditional power have been significantly weakened and peer-to-peer information exchange has replaced broadcasting. So the cold war ended, assumptions of 'other' people were further challenged and significant shifts in our ability to listen to new voices became possible. With this, systems of knowledge

transfer - pedagogies and histories have been put into question. Who would have thought 20 years on from a bloody and civic uprising in Tiananmen Square, one of the first tele-visual thorns in the side of the Chinese Communist party, that in 2008 FACT would be representing Britain in the Cultural Olympiad Programme, as part of the world's largest survey of media art at Synthetic Times at NAMOC, the national art museum of China?

Not only have we observed massive change, but we have been part of making it. In deciding whether to take part in Synthetic Times, the NAMOC exhibition, I had to make a call on whether the perception of FACT in this context was going to be positive or negative, and whether we were sanctioning a repressive regime. In retrospect I think it was the correct decision, FACT established new alliances and learned much about new Chinese Culture in the process. I also hope that some of the presentations which illustrated projects successfully finding new contexts for arts and health, disability and climate change to an audience that perhaps had not heard before and that such views may have some lasting impact.

Despite a healthy scepticism of art becoming solely instrumental in the UK context of millennial new socialism - talking in the pub, influencing beyond the art world and closed systems have always been of interest to me personally and at the heart of FACT. How to maintain quality and interest, how to build on excellence and engage more people is part and parcel of being an accountable publically funded institution. Spread and depth are the orders of the day.

As the worlds geo-political axis shifts, FACT has too, if Liverpool has dubbed itself the centre of the creative universe, perhaps the axis has been FACT. The FACT building may have been originally conceived as a techno-centric media art centre but has blossomed through love, time and need into a 21c Art Centre, the embodiment of contemporary hybrid research, or a practice based knowledge exchange, rich in participation, emulating strong, deep and social connections to a wide range of communities and places. The real-time negotiation of those relationships and nuanced interchanges, which motivate communication, exchange and action, is the fascination. It is through comparing difference that we learn. Process and comparison of what is both out there and in here is the end in itself. The ontological is where art and artists excel, though this often makes the quantification and measurement of its effects and impact hard to quantify, especially in a climate of late industrialised capitalism – where evidence rules and the credit crunched. In Great Britain, after the empire and empiricism on a half-life to nowhere, emergence is all we know. Since its inception, FACT has demonstrated commitment to making a difference and collaboration. If the world had become relational, the staff have emulated and pioneered an approach and enthusiasm which is infectious, demonstrating pioneering strategies of cultural leadership and arts-led re-generation, I hope this will help FACT and the arts ' industries' avoid being part of a wider cultural bankruptcy.

The proliferation and ubiquity of many precepts pioneered through (new) media arts practice are central to this and can be witnessed across a variety of sectors and networked conditions, from early telematic experiments by artists, to Skype. A new widespread condition of sociability invites us to question the role of media art practice and new media histories in the context of wider cultural and technological developments.

If artists, curators and activists were not knowingly creating a new paradigm or starting a revolution when experimenting with digital technology, we are able now re-assemble those connections and rationalize their importance. This is essential not only to respect and revise pedagogies, but to also remind us of where innovation begins. A range of ad hoc practices intrinsically performative, tactical and at times interventionist, were significant innovations and forerunners to what has manifested as a digital revolution, one re-defining all rules of engagement, collaboration and economy, feeding into evolving policy on convergence, broadcast and the arts. This leads to a number of questions:

How do we connect this past with new media histories to further demonstrate the importance of media art in a 'converged' 21st century 'digital age'?

How can these histories be re-positioned to re-claim their significance along with pioneering practices of

social engagement and inter-disciplinary practice?

Within a framework of emergent models of organisation, what methods of practice based research can be highlighted, evidenced and valued to create a case for further broader investment?

How can this history be tracked and shared to build future strategies of cultural leadership amongst a broader set of disciplines and histories?

How can local models of best practice interconnect with and learn from one another to ensure global relevance?

It is only now that we can rationalise post facto and reassemble those connections. This is important not only to ensure our place in history, but to also remind ourselves that the experiments of artists, designers and technologists have provided early warnings of the cultural, economic and political ramifications of new technologies, through a variety of media tactics, gesture, performance and resistance.

Equally, it is our responsibility to acknowledge the importance of diverse historical practices, contextualising media art and its histories in relation to the current explosion within digital and networked society. In demonstrating the significance of pioneering practices by artists, technologists, curators and our partners, we can chart how these influenced and helped to form emergent models of organisation and the trend towards personalisation, across a variety of sectors and in the new networked conditions. The ramifications of these types of video, media art and new media art practices have extended well beyond the development of discreet artworks, questions of genre, and the practice of art. While these are important areas in themselves, even more significant is the fact that video, media and new media art have been forerunners in what is now termed a digital revolution – a revolution that is redefining all rules of engagement, collaboration and economy. Increasingly, hybrid forms of body and economy, made explicit through experiments in biology and biotechnology, demonstrate the rise of the post-human – itself significant in challenging definitions of human and humanity.

Since the 1960's, a new media culture has been on the scene, introduced by artists such as Nam June Paik, and engineers such as Billy Kluver. Digital culture has become subject to many inquiries, from the early cyberlibertarianism of the 1990s, through to Manuel Castells' 'networked society', John Urry's 'mobile societies' and Bill Mitchell's 'city in bits'. Accompanying the critical celebration of the digital, numerous voices within the public sphere have emerged berating this world of wires. Media scholars have rejected many of the 'effect' based claims about digital culture, though it is necessary to acknowledge the normalizing culture of digitalization that occurs through prominent corporate forces and consumerist practices. Where are the origins of the digital within this contemporary digital world? Tracking how new media art has informed and become constitutive of new media culture remains an unexplored historiography of digital immersion.

Equally, situating new media art within broader social processes, such as urbanization and community regeneration - where FACT also sees its location – asks researchers to interrogate the historical place of aesthetic interventions within the socio-political sphere. While many artists' works address such issues, there has been limited research into such interventions and the frictions they create.

Additionally, the concentration of media art/theory on front-line consumers of 'innovative' communications technology in the West often overlooks the importance of who is being connected to whom, and what turbulence this may create within specific cultures, for example the conditions of less affluent cultures of Africa and Asia, and the disadvantaged at home. Whilst the effects of this turbulence are ultimately unknowable, due to the complexities of the relationship of the technical, social and cultural we can, however, create artistic and research projects that pose interesting questions.

Software and hardware both exist in the world, and at the same time make the world, and in this way have

the potential to open up new worlds and at the same time close others down for all cultures. Media systems can be examined within specific cultures to reveal their structural operations and each operative thread can be followed to reveal the contexts that they plug into.

At the time artists, curators and activists were not knowingly creating a new paradigm or starting a digital revolution, but it is only now that we can post-rationalise and re-assemble those connections. This is important not only to ensure a place in history, but to also remind ourselves of where innovation often begins with artists', designers' and technologists' experiments. FACT actively encourages experimentation, provocation and interference. It is artists that have repeatedly provided early warnings to the cultural, economic and political ramifications of new technologies through a variety of media and tactics, the performative and resistance. Beyond the body, beyond biology and technology, we are dispersed as one ceramic ribbon. The materials that form technology, and their use are part of complex power systems. Trust your instincts and the experience.

"For to perceive, a beholder must create his own experience. And his creation must include relations comparable to those that the original producer underwent… "

John Dewey, Art As Experience, 1932.

Still slightly exhausted from experiencing our own 2008 European Capital of Culture Human Futures Programme, we are currently delivering our 2009 UN-sustainable programme, launched with the Climate for Change exposition, this in itself is suggestive of FACT'S next stage as a cultural leader and policy former, where "the only currency is Co-operation". This is a time of extreme opportunity for FACT as a hub of innovation, interdisciplinary international partnerships and a centre of excellence demonstrating local connectivity and collaboration. Sharing will make our journey easier. As you twitter and muddle your way through exponentially networked conditions, you can blame us.

We invent the society we want to be. We are the real-time experiment.

No one has sensed in the past. No one has sensed in the future. Present is all one can sense for as long as the surface stimulation continues. ( )

As children are faced with learning how to do up their own buttons or cross the road for the first time, or understand what loneliness feels like, the human race has repeatedly had to re-adapt to an ever-changing environment. From finding new food sources or fuel to keep warm, or coping with the effects of war on a mass scale, it remains a daily reality that, for a large percentage of the global population, Human Futures means affording food to ensure survival. The context of the issues and discoveries explored in FACT's Human Futures programme last year, developed as a major component of Liverpool's European Capital of Culture 2008. Bringing together artists, scientists, philosophers, technologists and ethicists into face-to-face dialogue with the public, who have an equal investment in the future, we created conversations, workshops, exhibitions and symposia that were broad enough to engage people from a wide range of disciplines and which had multiple entry points for non-specialists. De-mystification of technical languages, artistic intervention and debate are central to creating more meaningful opportunities to consider how debates about the future impact on daily life. And this was planned well before the credit crunch. Towards the end of the year the context had changed radically as a form of viral terror spread through the mainstream media and trickled down through the banking community and into general society as banks tumbled and with them life savings, some of which belonged to a friend of mine from Iceland.

Although the media became saturated with images of collapse and dread we continued doing what was planned through the third and last quarter of 2008, Pipillotti Rist exhibition, Liverpool Biennial including the works of U Ram Choe, Ulf Langheinrich, Lisa Rheina, Tenrence Handscome and Stella Brennan. We were also planning our 2009 program UN-sustainable in response to Liverpool's slightly flaccid, Year of the Environment, because that's what we thought it was, un-sustainable, pre-credit crunch levels of expectation,

borrowing and consumerism, coming home to roost. It easy to say this with hindsight and 'victims' of things which go wrong in the future such as poor financial management, often wish they had taken different financial advice. The compelling thing about the 2007-2009 financial crisis is that everyone knew. A form of herd instinct allowing the most influential and privileged to exist in a state of denial, do we really want to know what will happen? This is a large part of the tension that rests in us as individuals, busy in the present and all debates around sustainability and economy.

The complexity of the legal, ethical and scientific debates that help us navigate around ideas about the future is vast, and intersection and cross-pollination is problematic. While our society today seems to offer infinite access to knowledge and while our interconnectedness invites the consideration of everything simultaneously, knowing everything nevertheless remains outside our grasp. On futurology, Bruce Sterling writes that,
'Tomorrow Now is a book about nearly everything. But you can't investigate every aspect of the future because it's like writing and investigating every aspect of the present.'

So, if it is in the present that we find our future, the problem of the vastness of everything and the elusiveness of understanding remains. This causes anxiety. And while we can try to predict some of the causes and effects of tomorrow from what we know about today, it is predominantly unexpected external influences that determine individual and group behaviour, and that lead to significant change. Change is difficult and can be painful, fear of pain can be worse than pain itself, and yet, how we deal with pain and change is not only governed by external forces, our power to imagine, re-narrate and innovate can give us comfort in changing circumstances. Most powerfully, our ability to imagine things differently can actually enact change itself.

Yet art is not a panacea for society. Neither is it a crystal ball into which we can gaze and see what lays ahead. It does not necessarily even provide us with any answers. With a self-reflexive sense of our own institutional agency, FACT's Human Futures programme has attempted to navigate a set of concerns about life that we face collectively at the end of the first decade of the 21st century. From the birth of cinema, through collage in film, to media artists' manipulation of individual frames and sub-frames, artists and technologists have explored non-linearity. Stories do not have to be told with a beginning and an end. Into a digital environment where editing and special effects blur seamlessly into primary production, the concept of the original is no longer so relevant, as all content can be manipulated. Truth and deception overlap.

Artwork and art process has the power to encapsulate some of the most complex debates of our times and, through offering a visceral experience, can traverse intellectual distances at lightning speed. Artists have synthesized worlds into which the possibility of representation is infinite. They have found new forms of expression and have animated new architectures. They have often attempted this outside the realm of pragmatism, the political, and the plausible. In this way, they sustain a crucial feedback loop into the dominant ideologies of our times by questioning from the left field and insisting that there are different ways of looking at a problem.

Producing a programme with the lofty ambitions of engaging theoretically and creatively to comment on the future of humanity raises a set of challenges. Applying this overarching title to a series of works that, like all good art, defy categorization, would have been glib over-simplification and reductionism had we not accepted from the outset that Human Futures was a mode of inquiry, as opposed to a didactic descriptive framework into which a whole body of work would sit comfortably.

Instead, we engage with the role of artistic practice in the broader context of knowledge and research development. Artistic practice is a process that, however focused in its questioning, rarely works in a linear fashion. The artists we have worked with have not taken the question 'what is the future of the human?' and tried to answer it literally. Pipilotti Rist's practice over the last two decades has drawn on the fragility and complexity of the human condition, exploring how mass media relates to individual identity, and how overarching systems such as religion can affect and structure the way we relate to the world.

The media systems we live and work within, with their velocity and insidious power, have been central to the work of AL and AL over the last ten years, as they have woven alternative universes out of computer-generated imagery and blue screen technology. Simultaneously critiquing and celebrating the speed with which a global cultural village consumes and worships fame and power, and the digital culture that reproduces and endlessly copies these persona icons across the planet, AL and AL's work was developed for the Human Futures programme from an 18-month residency in Kensington, a ward just outside Liverpool city centre. Of its time and of its place, Eternal Youth superimposes the aesthetic of the sci-fi film onto the collective psyche of lost boys in a city that is struggling to find its way into the 21st century.

The artists who contributed to curator Jens Hauser's sk-interfaces exhibition – from well-established artists such as Orlan, the Arts Catalyst group and Stelarc, to younger artists such as Zane Berzina and Julia Reodica – all produced work that focused the audience's attention on the big questions of life via the physical details of life itself: an ear growing on an arm, a cell being killed in a Petri dish, a pretty jewelry box containing what seems to be a tattooed piece of flesh that is, in fact, a designer hymen. Through capturing a fragment of life and turning it on its side to look at it from a different angle, these artists not only create potent artworks but also model new ways of looking at the world.

Art can bring the complexity of life alive. Zbigniew Oksiuta's experiments in creating environments that can operate outside gravity seem fantastical, and the workings of a sci-fi enthusiast with too much time on his hands. For instance, in one piece, the artist creates the conditions that would be needed to send a capsule of plant seeds into space to enable life to exist outside Earth's atmosphere. However, on closer inspection, his work engages with the scientific proposition that the survival of the human race will, in time, require leaving the planet. Oksiuta's work is highly formal and beautiful and points to the fragility of the conditions needed to sustain life. His art does not lecture us, nor does it represent scientific facts. Instead, it creates a space where we come face-to-face with the material reality of our existence; it makes the intangible and grandiose tangible and small. Alternatively, Swiss artist Yann Marrusich's moving performance complicates our sense of biological separateness and visualizes the shared system of intake and output that enables human life – breathing in and breathing out and the sharing of oxygen. His contribution to Human Futures sees the artist locked in a plexi-glass pressure-controlled tank after having ingested methylene blue. As the pressure rises, blue liquid starts to drip from the pores of his body; first from under his arms and from his mouth and then eventually the whole surface of his body releases the blue – even dripping from his eyes. Revealing the workings of a body that almost always remains invisible and showing how much we seep into the world around us, Marrusich's work raises concerns that are directly articulated by artist Oron Catts. Catts' work in laboratories has been driven by a concern that the ethical frameworks that exist within scientific contexts are not rigorous enough and do not consider the implications of what they mean for humanity at large.

We cannot separate art from the cultural conditions of its production and, more widely, its role within the public sphere. While thinking about the future in the public domain is a gesture towards a form of civic participation that, it can be argued, only the arts can access, this work does not aim to mask the harder realities of life. It does not cushion the blow, or get every participant a job, but it aims to carve out freer spaces for debate and discourse, where difficult conversations are allowed and, indeed, encouraged. The by-products of this process are often raised self-esteem and awareness, confidence and a sense of self-worth that can in turn lead to hard social outputs. By holding human futures at the heart of the matter the ephemeral character of socio-political agendas that could dominate our field of vision are held at bay. This has enabled us to look further than our immediate social concerns.

Debates led by FACT's community internet TV channel tenantspin have ranged from the real-time reality of Tesco-led regeneration, to the fact that one of the most profound challenges of the 21st century and the future of the human is our increased redundancy in an expanding post-industrial society. A post-industrial, post-climate-change society was the backdrop for the apocalyptic vision of young people who developed films with FACT's education programme exploring their concerns for the future. Their bleak depictions of life, where the chasm between rich and poor had become even more impenetrable, sickness more virulent

and humanity no more emotionally robust than today, provokes a conversation around what we need to learn today to have the tools we will need to survive tomorrow.

Our histories of art, science and media have run parallel to the rise and demise of industrialization of an increasingly bigger slice of the globe. Collective philosophical and empirical understandings of the world are imbued into the realm of art. In turn, art's economic framework is part of the globalized carbon fuel-based system that we live in today. Art is implicated in the structures it critiques. And yet, as the binaries of synthetic and natural, constructed and real, have become less and less helpful, it is our curiosity to investigate the relationships between things that lead to the development of new knowledge. Art helps us search again for those ideas that are often overlooked or taken for granted but which, if we could think about them differently, could significantly alter our experience. As Michel Serres (1995) has commented: 'the error condemned today will sooner or later find itself in the treasure houses of discovery'. (2)

By asking the question 'what is the future of the human?' FACT has aimed to provide a safe space for cross-disciplinary debate, art and practice-based research. Through actively encouraging experimentation, provocation and interference, we acknowledge that it is artists who have repeatedly provided early warnings to the cultural, economic and political ramifications of new technologies through a variety of mediums, tactics and gestures. Many of the following texts and images in this volume demonstrate how performative acts and resistance to accepting the status quo explode the terms of engagement and insist that we address big questions differently.

In a post-human, digital age where we can easily imagine ourselves beyond the physical confines of our own mind, body and world, art can offer the tools we need to think differently about ourselves. Obfuscating our collective, critical faculties at a time when we must think laterally and not literally would be folly. In this task, we find the role of art agencies – such as FACT and our international partners – to be to protect the complex practice of making art and to pioneer its inclusion in the social domain on its own terms. We are part of a vital learning process to help articulate what we value about art, what the public is most concerned about for their futures, and what our institutional responsibility is to the practice that is at our artistic core.

The exchange of ideas around these themes between practitioners and commentators across disciplines is essential in moving beyond image, surface and appearance. Humanity's obsession with status, wealth and control has, in the technology-rich 21st century, thrown an age-old quest for the extension of life into an increasingly possible socio-economic framework; the ramifications of this need intelligent and challenging discussion. Neither the hand of God, nor science and technology is going to fix things for us. That time is over. False expectation and reliance on other people to resolve things never was an answer. In imagining human futures we accept our own agency and re-invent media art histories. We invent the society we want to be.

"Art's task is to contribute to evolution, to encourage the mind, to guarantee a detached view of social changes, to conjure up positive energies, to create sensuousness, to reconcile reason and instinct, to research possibilities and to destroy cliches and predjudices." (Pipilotti Rist, 2008: 208). (3)

References

From Mike Stubbs (2001). Short film, ZERO. Celebrating the 40th anniversary of Yuri Gagarin's first manned trip to space, in an age when space tourism has become a reality what does the future hold for our new born? A first shaft of light, a fragment of an image, first movements and a sense of independence. Zero is a lyrical view playing on the metaphor of weightlessness, mobility, existentialism and consciousness. At what point are we aware of our own bodies, what is private and where does the external world begin? Text from writings by Net Robot, Netochka Nezvanova.

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Writing media art into (and out of) history.

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Abstract

This paper will review the context of the development of interactive media art within Australia in the 1990s. It is particularly interested in the conditions that enable arts practices to galvanize into an arts culture. Such conditions include publishing, the role of criticism and debate, funding, advocacy and the curation of focussed and dedicated exhibitions.

The paper will seek to ask some questions answers as to why the conditions of an emerging media arts culture in the 1990s have virtually lost momentum. And why, ultimately, the very notion of media arts has become annexed as a minor moment in the history of the moving image.

Keywords

Advocacy, Australian media arts, media arts history

One of the challenges facing any emerging artistic movement is the need to find an audience and generate a public. The process whereby a new form becomes part of culture involves what Julianne Pierce has described as an "active circuit" of access, information and understanding, an integrated network involving artists, access to and curatorial advocacy of their work, as well as critical discussion and evaluation of it (Pierce, 2001, 14). This paper traces the promising history of this process within Australian media arts during the mid to late 1990s and asks some questions to do with its status in 2009.

In 1997 the Australian Film Commission published *Other Spaces: The marketing, distribution + exhibition of interactive art*, a major report by Rachel Dixon on emerging media arts. Dixon's working principles in compiling the report hinged on the media specific nature of the work in question, emphasising CD ROM and the World Wide Web as media forms as well as modes of distribution. Dixon's attention to the pressures on established art galleries in relation to installation issues focused specifically on the interactive imperative, on the need to cater for the presence of computers and the logistics of people actually wanting to interact with them. The general tenor of the report is one of potential, the feeling that interactive art may soon take off.

What is really curious about this report is that even though it was commissioned and written at the height of interactive fervour in Australia (see Tofts, 2005), it was highly cautious in its observations to do with the levels of public familiarity with and access to interactive art, as well as the provision of funds and resources adequate to its support and development. Dixon's recommendations in *Other Spaces* suggest that by the late 1990s, interactive art was still finding its place in culture. This dual inflection, of curatorial as well as conceptual place, is as important and tenuous today as it was in 1997 (see Tofts, 1996).

Situations of interaction

The development of specific venues for engaging with media arts is relatively new. The opening in Melbourne of the Australian Centre for the Moving Image at Federation Square in 2002 and the Experimedia Gallery at the State Library of Victoria in 2003, marked a significant moment of consolidation in the provision of purpose-built spaces for the exhibition of interactive art. Prior to the introduction of these institutions, these "other spaces", virtually all media arts exhibitions were held in gallery and museum contexts that were not designed, nor well equipped for such work (such as Mike Leggett's and Linda Michael's landmark 1996 *Burning the Interface: International Artists' CD ROM* exhibition at the Museum of Contemporary Art in Sydney).

But access to new work alone is not sufficient to create an arts culture. In the late 1990s a series of exhibitions, directed at heightening understanding of the art of the cyber age, was held in different capital cities. In 1996 the Performance Space in Sydney hosted *Cyber Cultures* (conceived by Kathy Cleland and

David Cranswick) and Scienceworks museum in Melbourne staged *Cyberzone*. Both were designed to raise public awareness and understanding of the signature themes of the emerging world, from cyberspace and multimedia, to virtual reality and artificial intelligence. *Cyberzone* was memorable in that it included one of the most famous, internationally recognised computer-mediated works by an Australian artist to date, Jon McCormack's "interactive museum of un-natural history", *Turbulence* (1995).

Conceptually, this sense of place was also gaining momentum with the presentation of conferences and symposia devoted to critical discussion of media art. In 1992 the Third International Symposium on Electronic Art (TISEA) was held in Sydney and was the first substantial event to combine critical discussion with performances and exhibitions of work by leading Australian and international media artists. In 1996 the Melbourne based Contemporary Art and Technology group (CAT) presented *Digital Aesthetics One: new art and high technology* in Sydney (curated by Werner Hammerstingl and Carolyn Deutsher), featuring international speakers Mark Dery and Allucquère Rosanne Stone. In 1997 the Centre for Contemporary Photography in Melbourne presented *(Crack the) Binary Code* (convened by Kevin Murray), which addressed the apparent lack of informed, public discussion about the cultural worth of multimedia-based art forms. In the same year Experimenta Media Arts presented *Altered States: psychotropic visions and the digitally-corrupted gaze*, a major exhibition of Australian media art works organised around the theme of digital transformation (curated by Helen Stuckey and Shiralee Saul). Like *(Crack the) Binary Code*, *Altered States* took place at the same venue of the Interact Asia Pacific Multimedia Festival in Melbourne. The choice of this corporate venue was an inspired one, as it assured a diverse and concentrated audience for the exhibition beyond the usual media arts community. Both were incisive examples of the ways in which media arts curators at the time would leave no context unexplored to further public access to media art work.

In the name of media art: advocacy and support

These were important developments. They signalled that media art was a vibrant and ongoing engagement with the kinds of technologies that were being encountered on a daily basis at home and at work. Curatorial and funding organizations have been vital in translating this circuit of access, information and understanding into public profile, in the expectation that media art could mature from being an emerging to an established cultural form. The Australian Network for Art and Technology (ANAT) in Adelaide, whose mission, since 1988, has been to support established and emerging artists working in video, sound, performance and media arts, has been a seminal force in maintaining attention to the connections between art and technology, as has Melbourne based Experimenta Media Arts since 1986. More established organizations, such as dLux Media Arts in Sydney (formerly the Sydney Intermedia Network, which evolved out of the Sydney Super 8 Group in 1981) or the Experimental Art Foundation in Adelaide (formed in 1974), actively embraced the challenge and responsibility of supporting the interactive arts as part of their commitment to experimental practices across a range of media.

By way of activating this principle, the Australian Film Commission sponsored a series of timely publications and conferences between 1993 and 1998 to explore the convergence of film and emerging media. In 1995, for instance, Mike Leggett edited *Electronic Media Art: An International Guide for Exhibition and Distribution*. The guide was aimed specifically at artists and offered a comprehensive listing of national and international resources, from media arts events and exhibitions to distributors, internet service providers and online publications catering to critical discussion of computer-based art. Directed principally at the film industry, the AFC's *Filmmaker and Multimedia* conferences (1993-1998) were designed to introduce filmmakers to multimedia technologies and the concepts and techniques of interactivity. Whether or not they contributed anything to what could be called interactive cinema is not really the point. What they achieved was an important dialogue between an established industry and an emerging one on the theme of where screen culture *could go* in the future. This sense of anticipation, specifically in relation to issues such as the distribution of work, was evident in the last of the AFC conferences in 1998, *Being Connected: the studio in the networked age*, which was specifically devoted to the possibilities of the internet as a means of distributing work and a creative space of collaboration.

Critical practice: writing on media arts

The gradual sophistication of modes of distribution and access, both nationally and internationally, was important in making the work of Australian media artists available to prospective audiences. But access is not sufficient to create a critically informed audience for whom such work has a cultural place. Critical writing and dedicated publishing made a decisive contribution to sustained dialogue to do with media arts and, most importantly, to its status as information in the world.

Certain critics in the late 1980s and 1990s were prominent in characterising the emerging practices of media arts and, often, in the absence of public familiarity with the works under discussion, simply describing them. John Conomos, McKenzie Wark and the late Nicholas Zurbrugg are three exemplary figures who set about the task of finding appropriate critical languages and paradigms with which media arts could be situated. For Zurbrugg, media arts practices were the most recent manifestations of an ongoing historical sensibility that continued the "European modernist avant-garde's explorations of kinetic and electronic art". In 1994 he edited 'Electronic Arts in Australia', a special issue of the media studies journal *Continuum*. This was the first substantial collection of essays devoted to the study of "the new electronic arts" in Australia.

John Conomos, a practising artist and writer, had for some time been arguing for a more subtle and persuasive way of thinking about digital media in the context of convergence. Conomos was already doing the kinds of things that critics and artists alike were anticipating in relation to the advent of multimedia. Conomos' work, going back more than twenty years, was an intricate synthesis of film, video, performance, photography and media theory. His concept of new media as a cross-disciplinary mode of image-sound writing was influential in the burgeoning culture of media arts criticism in the 1990s (Conomos, 2007, 196).

McKenzie Wark represented a younger generation of writers growing up with computers, the internet and global telecommunications. During this time Wark emerged as Australia's most articulate and committed theorist of concepts such as cyberspace and virtual reality. From the mid 1980s onwards, Wark took media theory to very strange places, re-defining the world of social relations in the age of telecommunications as a "virtual geography" (Wark, 1994). Wark recognised in the inclusive involvement and open-endedness of media art a corollary of the kinds of relations between people and information in telecommunications networks such as the internet. This, for him, was the basis of a new aesthetics of abstraction that he explored in his writings on the interactive art of the early to mid 1990s (Wark, 1995).

Digital imprimatur: publishing media arts

During the late 1980s and 1990s, a series of important publications provided the cultural adhesive that gathered and cohered the dislocated instances of media art exhibition and symposia, providing a regular and reliable forum for discussion about it.

fineArt forum has the distinction of being the internet's longest running arts magazine (1987-ongoing). It was aimed at both professionals in the field as well as a broad, general readership. Founding editor Paul Brown and his successors Linda Carroli and Nisar Keshvani also maintained a strong ethos of aesthetic inclusiveness, in which media arts were discussed alongside traditional practices in the fine and performing arts. The advent of *RealTime* in 1994, the national bi-monthly arts magazine, included as part of its inaugural editorial policy to place particular emphasis upon hybrid and techno-arts that received little media attention. Under the stewardship of editors Keith Gallasch and Virginia Baxter, *RealTime* became the most reliable print source of regular reviews and critical discussion of media arts exhibitions, conferences and new work, as well as profiles of and interviews with artists. *Mesh*, initially the journal of the Modern Image Makers Association and, from 1996, Experimenta Media Arts, was one such publication that very early on included an ongoing focus on and commitment to the emerging "computer arts" scene. In 1995, for instance, the artist Peter Morse was interviewed in *Mesh* in relation to *Virtualities*, an exhibition of "recent Australian experimental computer and video art" he had curated for the Melbourne Fringe Festival at Scienceworks. The interviewer, Jun-Ann Lam, discussed notions of interactivity and the meanings of work such as Martine Corompt's *Cutometer* and Patricia Piccinini's *Mutant Genome Project* with mum, dad and the kids (Lam, 1995). This interview is historically significant in that it is possibly the first example

of an audience response survey tapping into public perceptions of the interactive imperative. While not specifically focussed on electronic media, *Artlink*, under founding editor Stephanie Britton's leadership, had taken an active interest in developments in art and technology, with special issues in 1987 and 1996 devoted to this theme. In a subsequent special issue on the theme of the "e-volution of new media" in 2001, Julianne Pierce (then director of ANAT) observed that the "fourteen years since that special issue of *Artlink* have seen a creative and technological surge, creating development, growth, transition and a rapid maturity" (Pierce, 2001, 18).

The publication that was synonymous with high profile, international exposure of Australian media artists throughout the 1990s was *21C* (1990-1998). *21C* was conceived in 1990 by Linda Wallace and Mark Wolff for the media unit of the Australian Commission for the Future, a government sponsored organization committed to raising public debate to do with futures issues. While *21C* was vigilant in its coverage of developments in CD ROM art, digital imaging, hypertext fiction and interactive media generally, it was not, ostensibly, an arts publication. *21C* was oriented more towards discussions of emerging phenomena associated with cyberculture, such as the internet, biotechnology, cyberspace, artificial life and technological acceleration generally. In 1994 *21C* went international with a new publisher, Gordon & Breach International, but still had the advantage of being produced in Australia. In terms of illustration and design, *21C* actively promoted the work of Australian illustrators and artists, many of whom were also the subjects of the very discussions of media art that the magazine included in its pages. The exclusive use of Australian artists could be interpreted as parochialism, a view that its longest serving editor, Ashley Crawford, flatly rejects:

> Parochial suggests we didn't look afar, but we did. The reality was the best stuff was coming out of Australia. We travelled and encountered work from all over and we were sent portfolios from London, Paris and New York. The aesthetic we were after was simply here all along (Crawford, 2004).

Testifying to Crawford's endorsement, William Gibson described it as "the best looking… pop-futurological publication in the world" (Gibson, 1997, 5).

Prior to *21C*, it was in the pages of *Tension* during the 1980s that we trace the gradual appearance in culture of the computer as an aesthetic object. Published between 1983 and 1990 by Ashley Crawford, *Tension* was dedicated to music, art, style and ideas. It was a kind of sedimentary record, a prehistory of the convergence of computers and art and was one of the first serial publications in Australia to be designed on an Apple Macintosh computer. Cheek by jowl with essays on '80s cultural icons such as Nick Cave, Barbara Kruger, Peter Greenaway and Malcolm McLaren, we encounter discussions of cyberspace, computer graphics and powerful new technologies such as the Quentel Paintbox. In a 1987 discussion of the impact of this technology on video, photography and the fine arts, Crawford observed that the increasing prevalence of computer graphics and synthetic imagery "is a perfect *avant garde* to close the century" (Crawford, 1987, 18).

So what went wrong?

Avant-garde movements have historically been *fin de siècle* phenomena that blend into the next century. Media arts in Australia have not enjoyed such longevity. This is not to say that media artists are no longer practising and exhibiting, or that criticism and discussion of media art has ceased. What is conspicuous is the diminution of focussed public attention directed at its place within culture, even as being marginal or fleeting. The concentrated momentum around its emergence that I have delineated above is to be expected of a new art movement, as is the diminution of novelty, since the very notion of the avant-garde is a temporary state that resolves into familiarity or obscurity. What were the reasons, then, for the relegation of media art to the background (apart from, that is, journalist Sebastian Smee's 2005 judgement that "few people, apart from a few dedicated insiders, are going to care about much of it in a few years" [Smee, 2005, 19])?

Smee's dismissive judgment was announced in a review of my book *Interzone: Media Arts in Australia* (2005). At the time I felt it was a priggish and short-sighted assessment of an art form that was not recognized nor respected by the "fine art" critical establishment. Now I'm not so sure. In a RealTime interview with Lizzie Muller published around the same time, I proffered the notion that "*Interzone* was designed to be a kind of policy speech to the Australian body politic to embrace media art as part of its national culture and not have it fade ignominiously into a minor footnote in the history of art in this country" (Muller, 2006, 23). Writing from the vantage point of 2009, I fear that this call was not heeded and media art is fast becoming a minor footnote. As the focus of this paper has been on the productive writing of media art into history, I offer a series of deliberately foreshortened provocations on the factors responsible for writing it out of history.

Five theses on the demise of media arts in Australia

The following five theses (in no particular order) offer suggestions in response to this question and are deliberately foreshortened in order to provoke further debate; a debate that, so far, has not happened. It is hoped that these questions will, once again, put the question of Australian media arts back on the cultural map.

1. Interactive fatigue

The attraction of the point and click interface in media art coincided with the emergence of the internet. Accordingly, the surprising novelty of a new kind of agency in and involvement with screen-based art was underscored by a more pervasive, utilitarian literacy that was becoming habitual and, therefore, no longer spectacular.

2. Mobility

The global ecology of mobile telephony has *détourned* prehensile dexterity acquired at the computer keyboard into the intimate realm of personalised gadgetry. Its expanding universe of "apps" continues to multiply the availability of things to do at any time of the day. How can an emerging media artist possibly compete with iFart Mobile?

3. Social networking

The ambient nature of contemporary communications has created the "virtual republic" described by McKenzie Wark in his book of the same name (Wark, 1997). From Facebook to YouTube and Twitter, myriad forms of domestic or pedestrian cultural distraction continue to rival art of any kind.

4. Consolidated revenue

Funding and curatorial bodies such as ANAT and Experimenta still provide *dedicated* support to media arts. The dissolution of the New Media Arts Board of the Australia Council for the Arts in 2005 signalled the conclusion that dedicated support for media art was no longer necessary and that the Oz Co's work was done in underwriting its place as an established practice alongside music, literature and the other lively arts.

5. Curatorial politics

The conspicuous shift away from sponsoring and exhibiting media art within the Australian Centre for the Moving Image has left an equally conspicuous hole in public access to, and perception of such work as an ongoing practice. If represented at all, it is branded as a sub-genre of "the moving image".

I chose not to list the leviathan of gaming culture. Luther nailed 95 theses to the door of the All Saints' church to kick-start the Reformation. I see no need for such excess in this instance.

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Relive the Virtual:
An Analysis of Unplugged Performance-Installations

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Abstract Can retro media make us relive the virtual from digital media? Following McLuhan's thesis that the proper characteristics of a medium are revealed through remediation, it could well be that retro media re-enacting digital media can make explicit what the concept 'virtual' entails. Therefore, two recent works are analysed that take as their starting point antique theatrical techniques (the ballet pulley, the panorama) to evoke optical illusions , not to stage another illusion but rather to do something else with it. Both works include a non-narrative interplay with antiquated technological installations that nonetheless generate a challenging experience for a contemporary spectator living in a digital era. The performance-installation *I/II/III/IIII* by Kris Verdonck stages a repetition in time in which the viewer gets trapped. By reviving virtual features into real ones and presenting them in replay- mode, the viewer discovers how a variation of sameness can evoke significant differences, or how identity arises due to a repetition in time. The installation *Location (6)* of Hans Op De Beeck displays an all-round view in a real but generic space which induces the spectator's performative power: like an avatar, the spectator can dwell in the virtuality of personal imagination.

Art is often a bastard, the parents of which we do not know Nam June Paik

Introduction

Technological media on a stage can fulfil radically different functions. In the theatre work of Erwin Piscator from the 1920's, for instance, his staging of the film screen intended to playfully insert a document from real life into a fictional spectacle. In contemporary theatre, however, a staged screen tends to assume the role of a scenographic prop, a narrative extra, or even a protagonist in the play. Instead of being just an instrument, technology on stage can also be the subject of a performance, especially with the rise of new media which displays how the novelties and possibilities of new effects can take central stage. Furthermore, a performance often aspires to uncover the phenomenon of technology itself, and how it mediates the world we live in. After all, a technological medium is not just a device but is a process that mediates our experience, knowledge, actions or interactions.

My discussion will focus on how the staging of retro theatre techniques can reveal what is essential about the virtual stance of Virtual Reality, and thus on how a remediation of new media by old media can make explicit the mediating nature of the technology at work. Note that this analysis implies a well-known media-theoretic assumption in reverse order: according to Marshal McLuhan in his *Understanding Media* (1962), the evolution of technology brings about new conditions that put existing media in a new perspective. In a similar respect, using old media to restage new media might create an anti-environment that generates a unique experience due to the contrast in the psychological perception of both: the disused and nostalgic technology versus the new but daily used (1). In a contemporary context, the observer's fascination for the logic of these retro-installations is particularly to be found in the liveness as well as the realness of the visual spectacle, in contrast to the recorded (or reproduced) and the artificial (or virtual) nature of mass media.

Concerning liveness, neither work stages a rehearsed text, like traditional drama does, but rather they relate to performance art in which a unique piece emerges here and now on the spot. They are also exemplary with respect to the so-called post-medium condition: it is no coincidence that both directors are fine artists who explore the powers of staging in order to reinvent their relation with an audience (2). While reusing antique techniques, neither work aims simply to create a theatre of attractions, to provoke a shock of 'the new' for a contemporary audience that is unfamiliar with these outmoded effects, nor are they intended to be a variety show reloaded in contemporary times (3). These works are not about the illusion in itself; they are about what can be done with it. The return to unplugged installations makes way for a retro-garde in creating a

special kind of immersion that consists of a unique, self-reflective awareness. Verdonck, for instance, as we will see, uses a special effect to develop knowledge of repetition. Hans Op De Beeck turns a panorama into an introspection- machine.

Kris Verdonck. ***I/II/III/IIII*****, (Dance performance installation (2007)** (4) can be enjoyed without any reference to digital culture, and Kris Verdonck does not intend such a reference. Nonetheless, this work is very instructive when looked at in this way.. In the first scene, we see a graceful dance of a ballerina buckled up in a ballet pulley that enables her to transgress gravity, flirt with it while making high ascending pirouettes. In a way, the infinite potentialities of virtual reality are literally embodied on this stage. In each subsequent scene, an additional, similar ballerina joins in, hanging sideways, which results in a beautiful and serene spectacle that also resonates virtual reality in terms of doubling, tweening and morphing. However, Verdonck does not just use the ballet pulley to create a series of optical illusions. The technological effect is used here as an instrument for an artistic analysis that reveals much about the virtual in a metaphorical and phenomenological sense.

Also in his other installations and performances like *Heart*, *Dancer*, *Rain*, *Box*, and *End*, Verdonck investigates how technology can make artistic features visible and how it can create situations in which chimera are materialised. This results in delusions that are not fake, but which are created truthfully, albeit with a mechanical set-up. Although Verdonck employs theatre's box of tricks, he avoids the hugger-mugger of the magician and adopts an anti- illusionist stance: he wants to expose and enlarge tricks in favour of a visual study. This makes him a *homo faber*; a researcher who is interested in techno-science to the extent that he can use it to make art that reveals the laws of action and interpretation.

I/II/III/IIII, for this matter, is a dance improvisation repeated in sequences with one altering variable that is literally put in the spotlight. In this way, the spectator becomes enclosed in a time-experience that discloses the virtuality of a repetition. An analysis: In scene 1, amazement rules. It revives the grace of the white birds in Swan Lake. A ballerina hovers like an angel, turning perfect pirouettes. No resistance, doubt or complaint, only an elegant 4 play of interaction, of action and reaction. From the second scene on, which is identical to the first, save for the fact that a second ballerina has joined in, the perspective is radically altered. The spectators now know that two more similar scenes will follow (the extra space for two more ballerinas is suddenly very present) and it becomes clear that the dancers are not characters, but are mere moving bodies, puppets on a string. They do not improvise. Instead they follow a rudimentary choreography that can be reproduced easily. But in the process of repetition, the perfection disappears: now the spectator can see what is different and thus what goes wrong. This emphasizes the failure and weakness of human action when bound by a system. The same weightless movements tend to transform into images of bodies dragged over the floor and turned upside down like hanging carcasses. The doubling shows that this performance also presents jumping jacks that are constrained in the sense that the common physical order we all obey is exchanged for an artificial formation. This invisible condition, which functions as a metaphor for any social formation, including a digital system like virtual reality, permits free movement, albeit limited to a necessary pattern. Note that the technical installation of *I/II/III/IIII* is not shown, as this could suggest a struggle between 'man' and 'machine' which could distract one from the fact that technology is only used to display an abstract interplay between agents and the coordinates of a system, any system. What is more, the dancers do not simply submit to this system, nor are they in a reactionary mode, busily searching for a transgression of boundaries. Instead they take imposed codes and conventions as conditions of possibility and thus symbolise the insight that freedom starts at the very moment one accepts being determined. In fact, the same holds for the avatars at our disposal; they provide a circumscribed and hedged freedom only if we have mastered the skill to employ them.

The third scene introduces yet another dimension. The appearance of a third ballerina confirms the assumption that this performance will only display a fourfold variation. But now the spectator is left alone, wondering about the significance of this repetition, until one realises that now also the spectator is trapped in a compulsive frame. Verdonck clearly does not want to titilate his audience with an effect of surprise, a sudden twist in the plot, a *deus ex machina*. At first sight, there is hardly any difference between the third and the second scene. The spectator is stuck in the wheels of reproduction. At the same time, the serenity of the play makes it too difficult to just get up and leave. The only escape hatch is to silently curse the artist

and endure the boredom. Following the dancers, it is now up to the audience to fold this imposed situation into a challenge: by re-examining something we have just seen, the spectator is given the opportunity of a double take in which small changes from the previous 5 scene become noticeable. An intriguing world of transient details is made explicit: we perceive inaccuracies that managed to escape the control of the dancers, as well as the technological arrangement; we notice failed attempts to do things differently; and we see how difficult it is for three dancers to repeat precisely the dancing of the previous scene together. Post factum, the fresh memory of scene 2 is also adjusted, for scene 3 highlights the mutual difference. Hence, in this repetition, identity is formed.

Finally, there is the fourth and final scene. The initial function of this scene is probably to avoid that the performance would stop with the third scene. Despite the conveniently arranged and well-measured simplicity of this performance, it would clearly be too abrupt to end it at this point. Knowing that this is the last round, and because of the obstinate deceleration of the previous scenes, the spectator is now beyond boredom and needs a continuation, a recap, an encore in which everything can be observed again for the last time. Scene 4 primarily adds viewing time. Like in scientific research, this is a final check that is meant to provide a definite impression and to confirm the performance as a whole. Therefore, the eventual function of this scene is to stage the repetition as repetition, for this final repetition emphasises the succession of scenes and gives each one of them meaning in relation to one another. With scene 4, Verdonck inserts a meta-level that raises form into content, since it shows the repetitive experiment as a structure, as something abstract which brings about its own cognitive mechanics. In doing so, he invites the spectator to question what is so special about looking again and again at virtually identical artistic formations. At the same time, he provides an answer: while a scientific verification is meant to specify facts and confirm empirical tendencies, *I/II/III/IIII* demonstrates that an artistic verification does not necessarily exhaust the viewer but, on the contrary, generates an interesting diversity of dimensions. As it happens, this diversity reveals the virtual nature of repetition: it demonstrates its potentiality to create diversity, but this very potentiality also indicates its spuriousness, since repetition is meant to be an identical series of sameness.

Additionally, scene 4 also procures a bizarre experience. In this scene— in the end, that is--everything seems to come together in a perfect unity after all. The dissonance of the previous scene seems to have yielded to symmetry and balance. This leaves the spectator with an open ending: is the harmony of the last part a real or a psychological phenomenon? Is it because the combined play of the dancers works out better after being repeated four times, or is it because the spectator has become so acquainted with this formation that it gets completed virtually? (5)

The work of Hans Op De Beeck does not explicitly focus on digital culture either, but it is significant for digital culture in at least two ways. Firstly, insofar as it is appropriate to assume a common denominator in his work, it often revolves around the virtuality of spaces. He created several works that literally embody a virtual spirit and thereby underscore how superficial public space (and life) can be—whether offline or online. Secondly, in his *Location (6),* the spectator can actually discover an essential condition of the virtuality of a virtual space like VR.

To begin with the first: Op de Beeck is a multimedia artist (i.e. he produces photographs, sculptural installations, video works and drawings, as well as short stories) whose work often concerns the clichéd, but nonetheless inescapable, atmosphere of public places, such as crossroads at night, a shopping mall after closing time, a motorway dinner, or an abandoned amusement park. These are, in a way, non-places that generate non-situations which are, at the same time, very familiar. These places welcome the observer, but as an extra, not as an individual character. Op de Beeck's unique style does not shy away from an aesthetic or even a kitsch look, resulting in strong images that tease the viewer with respect to established codes of minimal and conceptual art. Yet at the same time, he manages to express the incapacity of these spaces to fulfil their intention of bringing about a pleasant or even a festive and lively air. However, Op de Beeck's work is not about communicating an idea but rather evokes a sensible experience. Op de Beeck creates serene places whose exterior reveal an interior that communicates present-day modes of being-in-transit, without becoming moralistic or nostalgic. The aesthetics of these heterotopias balance on an ambiguity between revolt and resignation, between irony and Zen. In his life-sized sculpture *Location (5)* (2004), for instance, Op de Beeck rebuilt some seats from a snack bar at a motorway diner which 7 invite the spectator

to take a break and gaze out of the window at a nocturnal and deserted highway, imitated by means of a magnified perspective. Here, the viewer can actually enter the sculpture, become part of the space and perceive it from the inside out. Due to the fake setting, of course, the spurious realm of these non-places awaits its guests in full force.

With respect to the virtuality of virtual spaces, the installation *Location (6)* includes a mental special effect. Even though an immersion in VR is primarily a purely visual experience with minimal narrative guidance, the experience itself only works thanks to a massive input of performative power by the spectator, and especially the input of mental projection. *Location (6)* highlights the latter in an original manner. Obviously, there is always a minimal quantity of denotative code that escapes the control of the artist due to the use of materials and construction methods (this is true even of digital imaging, namely, the features of the editing program), and it is no different in *Location (6)*. Nevertheless, Op de Beeck opts for a vanishing denotation. That is, he reduces the details and references of his landscape to their bare minimum in order to free the connotative code of the maker. This reduction strips the display of evident narrative, changing these places from a token into a type: they represent any and every such place. Their presence can easily be ignored or even forgotten. However, as their anonymity is exacerbated, so too is their metaphorical quality enhanced. The lack of detail belonging to real surroundings is precisely the artifice that triggers the viewer's own store of memories, thereby making possible an empathic involvement. Thanks to the generic modelling, it is not the artist, but rather the spectator who is making the link between presentation and meaning or recollection (7).

A concrete analysis: Note that *Location (6)* is, in a way, a materialised copy of Virtual Reality. This indoor sculptural installation has the shape of a box that encloses a hermetic image-space. One must pass through a long dark corridor (which emphasises the start of a journey into the unknown) to enter this interior landscape. Once logged in, inside there is literally a modelled three-dimensional view: the visitor can sit down or wander around and experience this 360° panorama that seems to be put under a bell jar.. The large windows inside (which also function as 'a window on the world') between the look-out and the white space that locks in the senses of the visitor, echoes the glass plane of the monitor. Next, there is the phenomenological perception that is comparable to avatar-scopic vision, albeit in a real fake world. *Location (6)* offers the visitor an unplugged encounter with a piece of enlarged reality, here and now; it imposes a fixed perspective on the audience, defying the eye to roam and survey. Like VR, this world has come to a complete standstill, and the spectator can dwell on its view. This reality is there, continuously. There is no hurry; nothing will change while 8 the visitor looks away. The fake snow establishes a peaceful prospect and ensures that the environment will remain permanently frozen, for the simple reason that fake snow does not melt.

Also the limitedness and spuriousness of the first-person perspective is challenged in this panopticon. On the one hand, the staged world is laid out with the eye in mind; it can explore every inch of the landscape right up to its own boundary. The illuminated borders of the view form a true all-round horizon that coincides with the physical capacities of the human eye: its maximal scope. On the other hand, the eye fully dominates a panorama that exposes nothing but a white void, fresh and ready for our imagination to spill onto it. Thanks to this tension, *Location (6)* lays bare the importance of the imaginary power needed to resurrect this 'world'. The pleasure of sculpturing, for Op de Beeck, is to be found in the ancient idea of mimesis that drives the history of art: the attempt to construct something authentic. Furthermore, in the case of sculpture one can actually make a world with one's bare hands, and thereby gain a sense of being in control of the making of a fantasy. However, *Location (6)* is not an illusion that is meant to trick the visitor like a *trompe-l'oeil* painting; rather it is a clichéd and abundantly clear construction that eventually underscores how monitored and artificial the spectator's real world has become. Op de Beeck stripped all details and erased colours in order to obtain an anti-spectacle: vacant; white, even the waterless puddles and the sparse, windless trees lack any shadow. This pristine sleeping beauty shows nothing new. But exactly this absence arrests the visitor and makes way for reminiscences, for a somewhere to tilt into this nowhere, or for spells to undo the missing dimension of this infinity.

The stripped scenery guides the observer into the realms of personal imagination so that one can complete the depiction for oneself. The truthfulness of a scripted imagination is made possible by oblivion. Of course,

this shift can only happen on the condition that the spectator is prepared to suspend his disbelief and accept the invitation of the fake landscape to finish it, to interiorise it and hence bring it alive in his experience. And that, in my view, is exactly what the virtual stance is about (8). 9

Notes (1) This unplugged-strategy, by the way, already is a common artistic disposition. For instance, recall the pixel-aesthetics in the paintings of the German artist Richard Richter. Also, the Belgium artist Nick Ervinck makes colourful physical sculptures that emulate organic virtual structures. The American director Andros Zins-Browne created the dance performance *Second Life* (2007) in which old and young dancers simulated retired avatars on stage. And the Belgian artist Laurent Liefooghe created the performance installation *Viewmaster* (2007) based on the Pepper's Ghost trick, which allows two dancers to create real morphing effects. The discussion on still/moving in cinema is actually put on stage in this work (cf. Laura Mulvey (2006) *Death 24x a Second: Stillness and the Moving Image*). More information and video: http://www.vooruit.be/en/event/1609/media or http://www.liefooghe.be/. (2) Rosalind Krauss (1999) coined the term 'post-medium condition' in order to pinpoint the crossovers and intermediality in the fine arts. Contemporary artists hardly work within one specific medium anymore. Instead they are highly aware of the diversity of (old and new) media. They combine, upgrade, and mutilate media in order to generate interesting mutations. (3) Strauben (2006) discusses how post-cinema experiments resonate with the early cinema before classical, narrative cinema. Similarly contemporary post-dramatic theatre has a tendency to restage vaudeville aspects. But since theatre often responds to cinema culture and lacks a similar technological evolution, contemporary performances sometimes also return to the cinema of attractions (mechanical effects, slapstick, etc.). (4) More info and video: http://www.vooruit.be/en/event/1085/media or http://www.margaritaproduction.be (5) This minimal performance is also rich in other meanings. For instance, it refutes the influential definition of special effects being 'scripted spaces' (Klein (2003)). *I/I/III/IIII* is not a walk- through or click-through environment. Instead, it encloses a time-script based on a chronology. (6) More info and video: http://www.hansopdebeeck.com/ (7) Oliviera & Oxley (2008, 35) coined this strategy with the suitable term 'generic re-enactment' (8) This generic experiment clearly is a controversial 'echo object' (cf. Stafford (2007)): here, it is the absence of features that is doing the cognitive work.

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Relationship of art and technology: Edward Ihnatowicz's philosophical investigation on the problem of perception

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Keywords: cybernetic sculpture, perception, AI, art and technology, philosophy

At the earliest stage of computer's history more and more scientists as well as artists were vividly interested in the usage of advanced technology which was available that time. I would like to show that Ihnatowicz's motivation for using computers in the field of art was not strictly artistic or scientific, because he was more interested in resolving the problem of movement but in a slightly different way than other artists representing kinetic art. His investigation of the role of movement in the field of art led him to the more philosophical problems of the body engagement into the perceptual processes and, finally, to the problems of artificial intelligence. He considered the definition of artificial intelligence, which was then elaborated by researchers from computer science labs, not really operational and manageable. Ihnatowicz claimed that any system, natural or artificial, in order to be able to deduce anything about any object simply by looking at it, must at first be able to interact with the perceived object in some mechanical way. Basing on the Ihnatowicz's papers, his book proposal, archival materials and technical documentation I would like to argue that his cybernetic sculptures (i.e. SAM, Senster and Bandit) were not only artefacts, which may be considered as pieces of art, but also very important thought experiments in the field of philosophy of perception and AI.

In the papers of *PAGE,* the bulletin of the Computer Arts Society established in 1969 in London, debate raged about the originality of computer art, triggered by a text by Frieder Nake, published in October 1971. In his manifesto-like statement titled *There Should Be No Computer Art,* Nake said that he did not want to create computer art any more, as "the repertoire of results of aesthetic behavior has not been changed by the use of computers."[1]Nake did not have to wait too long for an answer. In the next issue John Lansdown responded with a text title *Computer Graphics does not equal Computer Art* in which he wrote that Nake's position might be true in case of computer graphics, but is not universally true about the rest of computer art. John Lansdow defined the work of computer art as a process rather than object, and claimed that at least three works come to mind that could not exist without the computer, namely the works of John Lifton, George Mallen's *The Ecogame*, Gustav Metzger's unfulfilled project *Five Screens with Computer* and Edward Ihnatowicz's *Senster*. The latter is described as "computer-controlled, 'intelligent', responsive to its environment in a way which makes other Kinetic art works seem like a toys".[2] During this debate, which lasted for about two years, the name of Ihnatowicz was featured regularly, as his cybernetic sculpture was given as the example of the first genuine computer artwork.

Edward Ihnatowicz claimed that the reason why he wanted to communicate his ideas about perception is that they are valid not only in the field of art but also in the field of science. In my paper I would like to propose a thesis that they were also valid in the field of the philosophy of perception. When we take into account that Ihnatowicz was a pioneer and one of the most outstanding figures in cybernetics and robotic art, it is not an exaggeration to say that he also pushed forward the philosophical understanding of such concepts as perception and intelligence. In this study I would like to show the process in which Ihnatowicz's ideas of mobility and physical interaction as the function of perception and intelligence evolved from the idea of motion in art. Ihnatowicz as an artist is the one of the finest examples of the interactions between art, technology and philosophy.

Ihnatowicz's involvement with computing started when he was working on *Senster* in 1968, one year before the Computer Arts Society was established and "before the possibility of using a computer was even considered", but for him it was such an important experience that even several years later he recalled it in

1 Frieder Nake, *PAGE,* May 1970, all issues of *PAGE* are available here: CACHe Project, Birbeck Collage, London, http://www.e-x-p.org/cache/CASarchives.htm

2 John Lansdown, „Computer Graphics. # *Computer Art", PAGE* 19, December 1971, p. 2.

the article published in the book *Artist and Computer* edited by Ruth Leavitt:

[This] experience has left me thoroughly entrenched in the computing field and apt to regard any present-day artist unfamiliar with computer with some concern![3]

Ihnatowicz studied at the Ruskin School of Art in Oxford, UK but he gave up art as his art activities and achievements dissatisfied him to date and he was dissatisfied by it, and for many years had been working for a company designing furniture, before he decided to leave this business and return to art in 1962. He felt that his art activities and achievements dissatisfied him to date, but in the same time he has resisted the temptation to join any of art trends, which was caused by his disillusionment with figurative art and the mistrust for the abstract one. While working with the old motor cars he made some abstract sculptures on the base of parts from dismantled cars and was hoping to find his own way to create fully genuine art.[4]

It is highly important to stress his artistic background here, as in the time when computer art was in the margins of artistic production and artists working with computers had a lot of trouble defining themselves as artists, Ihnatowicz claimed that he did not care about labels and defined himself simply as an artist interested in technology.[5] He treated the involvement of artists in science and technology as a natural phenomenon, which is not something new, because artists were traditionally involved in the investigation of nature, specifically those aspects of nature which were made accessible by the current technology.[6] His reflection on the relationship between art and science is faithful to the conclusion drawn from the discussion initiated by C.P. Snow's influential 1959 book *Two Cultures.* Snow distinguished there between the scientific and humanistic attitude[7]; the latter were described as being pervaded by scientific method, which is seen as embedded within language and culture, while to the first stance Snow ascribed a belief that the observer can objectively make unbiased, non-partisan observations about nature. Ihnatowicz differentiated between what he considered as a scientific and artistic approach as well, defining the first one by such elements as vision of the world as a vast natural system, operating on absolute and immutable laws which can be discovered by measurement and deduction, searching for firm data and immutable frame of reference; whereas the second one by acceptance of the instance of artist as the only reference point and demonstration of the way in which the world appears, instead of explaining it in an objective way.[8] The paradox of this differentiation exists in the fact that the artistic point of view is very often affected and influenced by scientific and technological enthusiasm and discoveries, so the impact of digital computing, control engineering and research in artificial intelligence is highly noticeable.

Ihnatowicz was fascinated with the concept of motion and methods of generating it. His work was up to a certain point influenced by Jean Tinguely, who was well-known for inventing machines able to move and to perform some imaginary functions as well as by kinetic art. Ihnatowicz's goal was, however, to create pieces capable of moving not in a repetitive way but more in a natural, animal-like way. It was a reason why he was especially keen on stripping a hydraulic breaking system from a car and its reconstruction because of its impressive smoothness and precision in moving heavy objects. This new idea of art was paradoxically a return to his previous interest when he created a number of sculptures out of parts of old motor cars. At that time, he did not treat them as serious or genuine pieces of art, but he simply enjoyed making them. He continued dismantling cars and thus he discovered that the shapes of the highly engineered components of cars are more interesting from an aesthetic point of view rather than his abstract sculptures. He even claimed that they are having "more conviction an air purposefulness and suitability for the task for which they were

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3 Edward Ihnatowicz, "Towards a Thinking Machine", in *Artist and Computer*, ed. Ruth Leavitt (New York: Harmony Books, 1976), pp. 32.

4 Cf. For more biographical details about Ihnatowicz: Richard Ihnatowicz, „Forty Is a Dangerous Age: A Memoir of Edward Ihnatowicz", in White Heat, Cold Logic. British Computer Art 1960- 1980, ed. Paul Brown, Charlie Gere et all. (Cambridge: MIT Press, 2009), pp. 111-118.

5 Brian Reffin Smith, *Soft Computing: art and design*, (Addison-Wesley, 1984), p. 148.

6 Edward Ihnatowicz, "Towards a Thinking Machine", in *Artist and Computer*, ed. Ruth Leavitt (New York: Harmony Books, 1976), p. 32.

7 C.P. Snow, *Two Cultures*, (Cambridge: Cambridge University Press, 1998).

8 Edward Ihnatowicz, "Towards a Thinking Machine", in *Artist and Computer*, ed. Ruth Leavitt (New York: Harmony Books, 1976), p. 33.

intended."[9]
Ihnatowicz tried to discover some methods for controlling the valves automatically and his first attempt to solve this technical problem were hydraulic pistons, which he tried to implement with a little success. After quite a long series of trials he found some pistons together with some servo valves.[10] In 1968 Ihnatowicz was finally able to complete his first cybernetic sculpture, which was in his opinion, the first genuine piece of art he ever made. *SAM (Sound Activated Mobile)* was exhibited at the *Cybernetic Serendipity*, an exhibition curated by Jasia Reichardt in the Institute of Contemporary Art in London.

Ihnatowicz`s idea was focused on constructing a sculpture capable of moving in an animal-like way, therefore he contacted several engineers working with powered prosthesis. He learned that when they want to create a prosthesis, they analyze with maximal accuracy the human limbs during the performance of various tasks. He discovered for example that the motion of a human elbow, when performing well-rehearsed movement from one point to another, can be simulated by an analogue computer because it consists of nearly constant phases of acceleration and deceleration. Ihnatowicz wanted to design a shape that had an air of "purposefulness and suitability for the tasks for which they were intended"[11] and eventually created spine-like sculpture. Zivanovic gives more details:

> The microphones were arranged in two pairs, one vertically and one horizontally. For each pair, an analogue circuit was used to measure the phase difference between signal on the microphones (effectively measuring the difference in time of a sound arriving at the microphones, and thus direction of the sound). This output of circuit was used to control the hydraulic servo valves so that the head turned to face the sound source.[12]

This circuit was designed by John Billingsley, a researcher from Cambridge University, and it worked to some extent though not yet perfectly. The sculpture was sensitive to quiet but sustained voice rather than squeals or screams. Jasia Reichardt reflects that "shrieks failed to provoke a response, but quiet words did, and a great many people spent hours in front of SAM trying to produce the right level of sound to attract its attention."[13] She wrote about Ihnatowicz`s sculptures (*SAM* and *Senster*) in the context of deliberation about possible perspective of ultimate machines, which will have desires and needs. Jasia Reichardt treated *SAM* and *Senster* as predecessors of machines that will respond to the environment, move, have means to restore their energy, and participate in dialogue with others.

Although it is very important to have at least minimal technical background to understand his technological ideas, the most interesting point is idea stands behind such experiments and invention. I will skip most of the historical and biographical information about the artist, as one can find them easily in articles by Alexander Zivanovic and Richard Ihnatowicz, but as far as the work of Edward Ihnatowicz is concerned it is impossible not to mention his second sculpture, the worldwide known *Senster* for it may

9 Edward Ihnatowicz, *Portrait of the Artist as an Engineer*, unpublished book proposal, pre-1988, http://www.senster.com/ihnatowicz/articles/artist_as_engineer.pdf

10 Cf. Aleksandar Zivanovic, "SAM, The Senster, The Bandit: Early Cybernetic Sculptures by Edward Ihnatowicz," papers presented on the "Symposium on Robotics, Mechatronics and Animatronica in the Creative and Entertainment Industries and Arts," AISB 2005 Convention, April 13, University of Hartfordshire, Hatgield, UK, 2005, http://www.senster.com/ihnatowicz/articles/articlesabout.htm and Brian Reffin Smith, Soft Computing: art and design, (Addison-Wesley, 1984), p. 150:

> "I can be very precise about when I discovered technology – it was when I discovered what servo systems were about. I realized that when I was doing sculpture I was intrigued or frustrated when I was doing sculpture, because I was much more interested in motion, I was trying to make my figures look as if they were about to take of and start doing something. We respond to people's movements to a much greater extent than we aware of".

11 Edward Ihnatowicz, *Portrait of the Artist as an Engineer*, unpublished book proposal, pre-1988, http://www.senster.com/ihnatowicz/articles/artist_as_engineer.pdf

12 Aleksandar Zivanovic, "SAM, The Senster, The Bandit: Early Cybernetic Sculptures by Edward Ihnatowicz," papers presented on the "Symposium on Robotics, Mechatronics and Animatronica in the Creative and Entertainment Industries and Arts," AISB 2005 Convention, April 13, University of Hartfordshire, Hatgield, UK, 2005, http://www.senster.com/ihnatowicz/articles/articlesabout.htm

13 Jasia Reichardt, „Art at large", http://www.senster.com/ihnatowicz/articles/articlesabout.htm

be perceived as the next step in the process of developing a sculpture that would imitate natural motion of animals or any other living organism. Ihnatowicz discovered that the neck-like shape he designed for SAM imitates somehow the natural form of the neck, however such an effect was not originally intended. He was amazed and astonished when he discovered that an almost identical shape exists in the nature in the joints of a claw of a lobster. It was the similarity in the shape that struck him so much, although the functional parallelism of these mechanisms turned out to be the real discovery:"In the lobster all the joints are simple pivots, but in spite of this apparent limitation and in spite of having only six of them in any leg, the leg can perform all the required motion with the perfect ease."[14] Struck by this idea, Ihnatowicz started sketching a full size sculpture based on such a leg. He planned to use miniature hydraulic actuators, introduced to Phillips by James Gardner in 1967. He used also a digital computer, which ran all the technological devices implemented into Senster. Like SAM, Senster was an interactive work, but in addition to responding to people`s voices it also responded to their movements. It was presented permanently in the Evoluon, a museum dedicated to science and technology in Eindhoven in the Netherlands, from 1970 till 1974 when it was dismantled.

Ihnatowicz was of the opinion that the way we perceive the phenomenon of life is influenced by the new discoveries in the fields of computing, space exploration, genetics, and especially robotics. People cannot ignore the fact that machines become extraordinarily clever and that "we seem to be in the imminent danger of losing our souls."[15] According to Ihnatowicz, an artist should embrace all the changes and follow them; he admitted that he appreciated the differences between scientific and artistic approach but did not care about the labels because although they have different criteria they have also a common goal: finding out what the reality is. In the interview with Jasia Reichardt he admitted that he is closer to the artistic point of view which is more close to life than scientific models.[16]

After *Senster* was shown at the exposition in Eindhoven, Ihnatowicz was invited to join the Mechanical Engineering Department of University College London as a research assistant. He felt a little bit disappointed that it was not a department of computer science since his main area of interest were the problems of intelligence and he considered that the ability of programming had more relevance to the problems he was addresing at that time. He discovered quickly that researchers in A.I. were concentrated on completely different problems and they applied different criteria and methods.

In the interview by Brain Reffin Smith, when asked about plans for the future he answered modestly:

I've done too much thinking and not enough doing, which is what I always complained about other artist.[17]

Ihnatowicz's statement is probably a sign of his disappointment with the fact that due to financial constraints he was able to complete only three works. It might be true from the artistic point of view, but his considerations about intelligence as equally important as his artistic realizations. He claimed in his personal statement that all his efforts were concentrated on the problem of motion but that he wanted to ponder this problem in the wider sense as the epistemological inclination of the idea of motion must be considered at the intersection of engineering and philosophy. Ihnatowicz wrote that the limitation of robotics is the fact that robots cannot deal with any unpredicted changes in their environment and the reason why the scientist cannot solve this problem is our lack of understanding of very complex processes of perception. According to Ihnatowicz, we are not able to learn anything about any object by looking at it, because instead of simple observation we must be able to interact with it in a mechanical way. Moreover, only these

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14 Edward Ihnatowicz, *Portrait of the Artist as an Engineer*, unpublished book proposal, pre-1988, http://www.senster.com/ihnatowicz/articles/artist_as_engineer.pdf

15 Edward Ihnatowicz, „Art and Technology today they should be on better terms", brochure published by Edward Ihnatowicz in 1968, http://www.senster.com/ihnatowicz/articles/index.htm

16 Cf. Stephen Wilson, *Information Arts. Intersections of Art, Science and Technology* (Cambridge-Massachusetts: MIT Press, 2002), p. 60.

If I had to determine Ihnatowicz's approach to the relation of art and science, I would describe it, according to criteria established by Steven Wilson in the book *Inforamtion Arts*, as an exploration of new possibilities, because his works function as a research into new capabilities opened up by a line of inquiry.

17 Brian Reffin Smith, *Soft Computing: art and design*, (Addison-Wesley, 1984), p. 147.

aspects of objects that can be modified by such actions can everbe successfully interpreted and understood. This presupposition lead him to important implications in the field of visual data processing as the claim that future "thinking machines", as he called them, will be not just computers but robots. He assumed that the most obvious manifestation of intelligence would be the ability to learn, and he tried to work out the simplest manifestation of that.

Ihnatowicz figured out that if he wanted to work on the problem of intelligence inartificial systems, first he had to solve the problem of defining such concepts as perception, knowledge and information, because he used them without really understanding their meaning. He considered all attempts creating such definitions impossible and the existing definitions unmanageable and came to the conclusion that the only way in which one can define these concepts is to create an ostensive definition which conveys the meaning of terms by pointing out examples, because the nature of the terms is difficult to define verbally. His idea was to rely on case-based reasoning so he decided to abase his research on simple biological organisms like bacterium *Eschericha coli*, lice or maggots, hoping that patterns of their behavior would be so simple that it would serve well as explanation for more complex systems.

What he found illuminating, was the difference in behaviour between the woodlice and maggots which both orient themselves to their environment with very simple sensors. Woodlice like moist places and have a simple device of slowing down their random movements when there is increase in humidity whereas maggots find light by single, non-directional light-sensing organ at the end of their body which they are able to swing from left to right, allowing the amount of light gathered during each swing to determine the extent of their forward motion. The simplest animals respond only to immediate influences such as temperature, brightness or salinity, whereas the higher forms are searching actively for most advantageous conditions, as they are aware of themselves as separate from their environment, which is the acceptable manifestation of intelligence. In the case of maggots they keep altering their course until the amount of light sensed on both sides is equal, so they behave with more efficacy and can direct themselves towards light much more purposefully than the woodlice who will reach its objective only if there it is a continous gradient between the moist and dry areas.[18] The other and more important difference between these two organisms is that maggots are probably able to work out the direction of the light and have the ability to move in its direction. Ihnatowicz speculated on this basis on the relation between perception and the physical motion as its indispensable condition.

Rodney Brooks in the article "Intelligence without representation" wrote that early works in AI concentrated on games, geometrical problems, symbolic algebra, theorem proving and other formal systems, semantics of which were fairly simple, whereas following development in the traditional approach in AI in the late sixties and early seventies has emphasized the abstract manipulation of symbols.[19] Ihnatowicz's criticism of AI research is based on the conviction that looking at the information in abstract way in which we attach meanings to formal arrangements of elements within some set of data is useless in the ground of research of intelligence and perception, because any abstract rules or laws of nature "constitute information only to the extent to which they can be interpreted by specific cognitive system".[20] He investigates this problem starting with the classical argument of the philosophy of perception known as the "Molyneux Problem".

In the letter addressed to John Locke, William Molyneux asked a question whether a man who has been born blind and who has learnt to distinguish and name a globe and a cube by touch, would be able to distinguish and name these objects simply by sight, once he had been enabled to see.[21] Locke used this thought experiment in his *An Essay Concerning Human Understanding*, and gave his own explanation, arguing that a person who lacks some sense will never be able to acquire the ideas pertaining to it, as he distinguished between the ideas we acquire by means of one sense and those we acquire by means of more

18 Edward Ihnatowicz, "Maggoty Intelligance", unpublished, http://www.senster.com/ihnatowicz/articles/maggoty_intelligence.pdf

19 Rodney A. Brooks, "Intelligence without representation", Artificial Intelligence 47 (1991): 139–159.

20 Edward Ihnatowicz, "Maggoty Intelligance", unpublished, http://www.senster.com/ihnatowicz/articles/maggoty_intelligence.pdf

21 "Molyneux Problem", in *Stanford Encyclopedia of Philosophy*, http://plato.stanford.edu/entries/molyneux-problem/

than one sense. Among the ideas that are acquired by combination of senses, Locke reckoned those of space, rest, motion and figure.

I have mentioned Locke in the context of the "Molyneux Problem", as Ihnatowicz's investigations on perception and intelligence is congenial to his philosophical position, his consideration of the maggot's behaviour proved that the minimum requirements for the cognitive system are: one-directional sensory input, one proprioceptive feedback and a motor output, as he claimed that the ability of physical interaction is indispensable in any cognitive process. Ihnatowicz has written about the information processing in relation to a one-input system:

Can the term „information" have any meaning in such situation? In the first place, what is tramsmitted via any communication channel is not information but data. To consider data information implies that the data is on its way to some processing system which is in a position to interpret it by correlation with other data from different channels either arriving simultaneously or previously stored in some memory. In a single-input system such a possibility clearly does not exist.[22]

Ihnatowicz was convinced that most of our appreciation of the world around us comes out of observation, interpretation or sense of physical motion. These are the particular areas where technological innovations and investigations can open a completely new way of perceiving the world and in the same way of understanding of reality. His general argument consists in the claim that all our perceptions depend somehow on the interpretation of physical movement, which we are accustomed to attribute the purpose or intention.[23]

The technology provides us with a variety of sensing systems which, at least theoretically, enable us to construct the machines that mimic the motion of living organisms but in fact the real problem turned out to be more complicated that anyone could have ever expected because as Ihnatowicz claimed: "The essential difficulty lies in the fact that the computers are merely glorified calculating machines and have only memories while what we really need are machines that have understanding." [24]

22 Edward Ihnatowicz, "Maggoty Intelligance", unpublished, http://www.senster.com/ihnatowicz/articles/maggoty_intelligence.pdf

23 Cf. Edward Ihnatowicz, "Towards a Thinking Machine", in *Artist and Computer*, ed. Ruth Leavitt (New York: Harmony Books, 1976), p. 36: "I am planning to make aim ultimately at making the spectator aware of just how refined our appreciation of motion is and how precisely we are capable of interpreting the intention behind even the simplest motion. For an artificial system to display a similar sense of purpose it is necessary for it to have a means of observing and interpreting the state of environment".

24 Edward Ihnatowicz, „Art and Technology today they should be on better terms", brochure published by Edward Ihnatowicz in 1968, http://www.senster.com/ihnatowicz/articles/index.htm

ARS ELECTRONICA re:shaping a city's cultural identity

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Abstract: 30 years ago the first Ars Electronica festival took place in Linz, Austria. Ars has grown to be one of the most influential Media Art festivals and centers worldwide. But while much has been written about it, and still more will be talked about its history when Ars celebrates its 30th anniversary in 2009, there has not yet been a comprehensive study about Ars Electronica's influence on the local community and its impact on the cultural development of Linz. This paper investigates the sociocultural and artistic traces Ars Electronica has left on the city of Linz. This Media Art historical account also details a very personal history, as the author, being four years old at the time of the first festival and amazed by its fireworks display, remembers the festival's beginnings from her personal experience and ñ having worked for Ars Electronica's Futurelab for many years - from a professional perspective as well.

The main question of this talk is how the then marginal field of art, science and technology, placed in an even more marginal, working-class and steel-producing city contributed greatly to the creation/development of a new cultural identity of the city, the art scene and the community as a whole. My investigation into the histories of this cultural institution focuses on the regional impact, regional being interpreted as geographically located/rooted as well as interpersonally built.

Keywords: Ars Electronica, public space, cultural identity, local communities, media art histories

Linz = Province

Linz is a practical city. You can tell, for example because you can't study humanities here. Instead, it has a huge steel company, and consistently, the university mainly focuses on technology. Up until recently, the Art University offered a program simply called ìmetalî1 . It seems that the city has no sense for the beau arts and never established its own fine arts tradition. Its cultural identity is one of working class and industry. Everything is headed towards production.

Heavy industries, founded by the Hitler regime in World War 2, made Linz grow and get prosperous. Before that, Linz was not known for anything. Afterwards, it was known for its bad air quality. Being a prosperous and promising place, you don't want to be known for that. You want to be known for beautiful achievements, for your culture. Only problem was, since Anton Bruckner Linz did not have any famous artist of international caliber. An identity that was not connected to dirt, pollution and province was needed. Being situated in the middle of two cultural capitals with their rich histories, Salzburg in the West and Vienna in the East, Linz suffered from being a cultural dwarf, a province. In this vacuum, something that would really make a difference, a strong, modern and unique cultural identity was desired. And because it was not possible to conjure one out of thin air, Linz would have to invent itself as the city of the future. In the 70s, inspired by the general political air of the time and promoted by the social-democratic administration under chancellor Bruno Kreisky, the idea was to offer ìculture for allî. In this spirit, Ars Electronica came to life.

The Invention of the Future

One of the first of these ìcultural attacksî on Linz in the 70s was the start of the annual Brucknerfestival, named after the one patron saint of art that was summoned ever so often these days. Bruckner was the alibi, the certificate that guaranteed that what is done under his auspices is art. The framework of the festival also served as an environment for more daring experiments like the ìforumî-series, comprised of forum steel (1971, 1975), forum metal (1977) and forum design (1980), which received a lot of international praise - and public outrage against some of the artworks. For example, the artist collective Haus-Rucker-Co's ìNike of Samothrakeî2, an eight meter huge statue that was put on top of the art university's roof on main square. Much hated by the public, it was soon removed. But as one of the first ìcultural victimsî, after it's death (= removal) it began a kind of after life and became a local myth. Ten years later, in 1987, it would return as a small statue and become the Golden Nica of the Prix Ars Electronica3.

Metal flows in the city of Linz's veins. Metal was what brought the city to life. It had become THE symbol of prosperity and the city's working class identity; it was responsible for the prosperity of the 70s as well as for the decline in the 80s. And it turned into an artistic material. Very different, but also connected to industry rather than art, was another promising material. The fast approaching development of microelectronics was regarded as the 3rd industrial revolution. And Linz not being a cultural city, but an industrial one, could be imagined as taking this direction into its future. This would transport the city's past into modern times without meaning a complete break from its roots; the digital phoenix would be born from the industrial ashes. The computer thus became a substitute for metal and was introduced as the new cultural medium before the culture was even there. It was a top-down approach driven by the desire to create a unique, authentic identity. Metal and microelectronics were promising materials for both the economic and the cultural future of Linz.

Linz welcomes the Future

In the late 70ies, the heads of the then very young regional studio of the Austrian broadcast cooperation ORF also went on to search for a cultural identity for Linz. Not a search, but rather an invention. Chance happened, that right then electronic musician Hubert Bognermayr from Eela Craig approached ORF Upper Austria's director Hannes Leopoldseder and his colleague Christine Schöpf with his idea of an electronic music festival. In this proposal, Leopoldseder and Schöpf saw the potential for the festival to become something much bigger. In the end, the music festival was accompanied by a competition (simply called ìthe big prizeî and later replaced by the Prix Ars Electronica) and a symposium, that was held in cooperation with the local university. In these events, the topic of microelectronics should cross disciplinary boundaries, involve artists and engineers alike in dialog and give fruitful new input for everyone4. Inspirations for the festival also came from Nove Tendencije, Siggraph and Steirischer Herbst, a festival for new art in Styria. As the idea was born, the first Ars Electronica was to be held from the 18th to 21st of September in 19795 and Linz was ready to welcome its brand new cultural future.

That this first Ars Electronica was not a one-hit-wonder was mainly due to the huge success of one of its highlights, the ìKlangwolkeî (Cloud of Sound). From the beginning it was clear, that Ars Electronica would not be a mere art festival, but a cultural festival that would involve the public. In this spirit, the Cloud of Sound was conceived as a huge outdoor spectacle of classical music and visualizations. Inside Brucknerhaus, the orchestra performed Bruckner's 8th Symphony; in the park outside, along the Danube, vast loudspeakers broadcast the live music from the concert hall and the sky and river served as a gigantic screen. The concert was also live broadcast on the radio and people who could not come to the park were invited to put their radios in the open windows and thus contribute by making their own mini Cloud of Sound. The original plan also involved people walking around in the park, from one loudspeaker to the next and thereby having an ever changing musical experience. This did not work out, because about 100.000 people attended and there simply was no space to move. (Just to compare it with, the whole population of the city is 250.000.) Because of this ñ also in terms of cultural politics ñ huge success, it was immediately clear that the Cloud of Sound had to be repeated (= would receive public funding) and thus a second Ars Electronica festival was bound to happen6. As an effect, for a long time the terms Ars Electronica and Cloud of Sound were used synonymously, the two events perceived as one and the same thing. They were not only meant to profile Linz to the outside, but first of all to the people in Linz. Via the transposition of Anton Bruckner into the realms of electronic music and art, Linz and by this its population should become culturally recognizable.

In the last paragraph of his article for the first Ars Electronica catalogue, Hannes Leopoldseder wrote: ìARS ELECTRONICA is not an event that deals with a record of the past, but addresses the developments of tomorrow. For this reason, this event about electronic art and new experiences has the notion of the incalculable and risk, too. At the same time, however, ARS ELECTRONICA is a challenge for artists, technicians, cultural critics, and not least the audience, that will encounter new expressions of art.î 7

Top-down and into the future was the way to go that is addressed here, out of the museums and into the open space, involving the public, not just an interested, international or even intentional audience, but foremost

the local community in and of Linz. In the years that followed, Linz saw a number of spectacular Clouds of Sound, for example Isao Tomita's laser show ìMind of Universeî8 in 1984. The sky was the limit in 1982, when the topic of the whole festival was Sky Art. Otto Piene, being the main organizer of these events, collaborated with Charlotte Moorman in ìSky Kissî9. Moorman was floating above Donaulände, playing her cello, hanging suspended from a bunch of balloons for a whole day. Conquering the sky with balloons remained a topos and was picked up again in 2005 by local artist Martin Music, who tried to fly across the Danube, supported by 5000 inflated balloons only10.

As Ars Electronica and time went on, ever new places were occupied. The city's baroque main square repeatedly became the center stage. As of its central location, also the (unsuspecting) public constantly became involved in Ars Electronica. Examples from the early years include "Klangstraße" (Sound Street, 1980, by Michael Jüllich)11 and Walter Haupt's "Mach-mit-Konzert" (Join-In-Concert, 1980)12. Two of the most spectacular events were Giorgio Battistelli's "Steel Opera" from 1982 and Klaus Schulze's "Steel Symphonyî (1984)13, that both involved the steel mill's workers and machines in their performances.

Especially the 80s and early 90s saw another public space being occupied and taken over by artists. ORF as an organizer became a protagonist of plays, where art became media art because of fully being accomplished on their channels, in their broadcasts, and sometimes even through the credibility of their reporters. ORF provided TV and radio as a platform, tool and material for artists. Very often, this resulted in Media Art in an Orwellian style. For example, in ìNobody is Safeî14 from 1991, when local artist group Stadtwerkstatt requested the TV-audience to vote whether a little dog should be blown up15. The result was that the dog should be executed and the dog was exploded live on TV. The audience was enreaged and the next day ORF had to declare that it was all a hoax, an art project, and that the dog was well and alive.

Playfulness always was one of the main ingredients to involve the public into participation. Whether it was that people should bring self-made instruments and gather on main square to be an orchestra or to cast their shadows in Rafael Lozano-Hemmer's ìBody Moviesî (2002)16. Playing Pong together in Loren and Rachel Carpenter's ìAudience Participationî (1994)17, simply being specators of Theo Jansen's ìStrandbeestenî (2005)18, or collaboratively writing a piece of code by climbing a facade in Gruppe FOK's ìTeleklettergartenî (2003)19 are just a few of the many, many examples. Playfulness and events in public space both were used to literally get people in touch with art. Events like these also perfectly fit in with the city's desire of providing ìculture for allî and ìculture by allî.

Networks

In addition to the city's support, the takeover of the public and its spaces was only made possible through a dense network of individual and institutional cooperation and collaboration. From the beginning, the local alternative art scene has been involved20. Stadtwerkstatt, contained (in the mid 90s, followed by:), time's up, Radio Fro, servus.at, transpublic, Kunstraum Goethestraße and Social Impact ñ to mention just a few ñ mainly contribute by developing their own projects for the festival and providing their spaces. Museums like OK centrum, Brucknerhaus, Stifterhaus, Designcenter, Lentos, the Art University, the Architecture Forum or Landesgallerie21 host exhibitions and events and also give support to the artists. Private companies sponsor the festival and Prix in general as well as individual projects.

Ars is not just an event and museum, but also represents a tight personal network of friends and collaborators, internationally as well as locally. First and foremost through the still ongoing involvement and commitment of the founders Christine Schöpf and Hannes Leopoldseder, early supporters like Kathy Rae Huffman or Roy Ascott, who were also part of the group that gathered to write the proposal for the Ars Electronica Center in the early 90s22. Via radio art and telematic projects, current director Gerfried Stocker got into contact with Heidi Grundmann, who was working for ORF's culture department in Vienna and founder of Kunstradio and her husband Robert Adrian X. These two had already been in close contact with Schöpf and Leopoldseder and were part of the proposal group as well. When Stocker became the artistic director of Ars, he brought with him a network of friends and collaborators from his home in Styria. Through all the changes that Ars had to undergo in its 30 years, these ties meant stability and kept the original spirit

alive. Change and stability together contribute to the success of Ars Electronica. Similarly, almost everyone in Linz who is interested in culture has directly or indirectly been involved in the Ars Electronica festival. As the city is small, most of these people also entertain personal friendships amongst each other and work together in various small and large scale, temporary and permanent projects and groups. In addition, through Christa Sommerer and Laurent Mignonneau's Interface Culture Lab at the Art University and the working opportunities at Futurelab, a lot of international students have come to Linz and enriched this network.

The relation between Ars Electronica and the alternative scene is not always unambiguous and without friction, but nevertheless has proved to be fruitful for both sides. A lot of the most interesting festival projects come from the alternative scene. One of the earliest examples of this involvement is Stadtwerkstatt, a group that started in 1979 as well. Stadtwerkstatt was invited to contribute by founder Christine Schöpf as early as 1984 (with their project ìSinging Poolî). The ìenveloping-techniqueî of placing new cultural experiments in the context of an already existing, strong and stable framework is still continued in the collaborations of Ars Electronica with the local art scene, but ñ at least in the view of the alternative scene ñ tends to act patriarchic and at times not as an equal partner.

Cultural Identity and Politics

Culture as something that was identified as badly missing became a political issue. In the spirit of the 70s when the administration of social democratic chancellor Bruno Kreisky was responsible for a lot of social advancements for the public, like free access to universities, free school books, affordable public housing, etc... culture also became a public good and should be freely and openly available for each and everyone, especially for the working class. To achieve this goal, culture had to come to the people and get out of the ivory towers of museums. In the Cultural Development Plan (CDP23), these goals are still alive. To bridge the gap between high art and ìculture for allî is one of its main goals. The CDP was created by politicians, art institutions and artists together. It sets the longterm goals of cultural development for Linz. Written in 1998/99, it builds on three pillars, technology and new media, public spaces and the alternative scene. That Ars Electronica plays an important role in the public perception of this development, is made clear:

> ìThe focus on technology and new media can only be successfully maintained if we can together provide a package of innovative and financially secure measures effective in the longterm. With the support of the Federal Government and the Province of Upper Austria, the Ars Electronica Festival should be put onto a broad financial and institutional basis to consolidate its international status, to ensure its strong presence in the Open Space sector, and to promote ever closer ties with the city and the region. A closer relationship between art and science is also needed.
> [...]
> The further development of the concepts "Culture for all" and "Culture in open spaces" will remain in the future an important focus of activity for the City of Linz. We see the development of a new type of "Culture for all" concept in a direction leading towards "Culture by all" as an significant contribution to the establishment of a democratic cultural policy. It is important above all to promote the active participation of as wide a spectrum of the population as possible in the cultural life of the city. Projects involving measures of this sort receive particular support (further development of the Cloud of Sound concept, artistic enhancement of city spaces etc.) and this element is taken into consideration in the city's own cultural projects (see also the chapter "Promoting culture and the arts").
> [...]
> The stronger integration of Ars Electronica into the "Open Spaces" concept, and the further development of the "Cloud of Sound" is another part of this expansion of the Art and New Media platform.î24

One aspect that effects the alternative scene in particular is that part of the funding which Ars Electronica receives has to be re-distributed by Ars Electronica to the alternative scene. This is mainly the case for festival productions. It is meant to involve local artists and groups into the international festival and by that to give them a platform far bigger than what they would usually have. But as project proposals first have to be acknowledged and evaluated for funding by Ars Electronica, the model is mainly seen as hegemonic and thus not appreciated. For that, the relationship between Ars Electronica as the Big Brother and the local alternative art scene is not always without friction.

Local politics stylize Linz as a symbol of the future-oriented community par excellence, that now is prosperous and productive in both culture and economy. They still perceive culture as something that can be produced in an industrial manner rather than something that grows. Through the tendency of thinking that only the new is good, of permanent progress almost became an obsession and sometimes it seems that too much emphasis is attributed to this aspect. As in many other Austrian museums and as a result of public funding for museums, the city's political representatives are also board members of Ars Electronica and still guard its overall development.

Ars Electronica in the Public View

Using so many different platforms, being around for such a long time, using so many institutions' spaces and temporarily taking over their audiences and employees, using TV and radio as another public space, it is hardly possible not to participate in Ars Electronica. While many people might not regard all the projects as art, there definitely is a high recognition and pride of Linz's international top-position in Media Arts.

In a poll conducted by the opinion research center Spectra in May/June 200825, when asked what they spontaneously associate with Linz, people mentioned Brucknerhaus in the first place, followed by Ars Electronica in second and the Cloud of Sound in third place26. They also said that compared with other cities in Austria, they see Linz as a) an industrial city, b) the city in Austria they associate most with technology and that c) stands for digital art27. By the people of Linz, the city is perceived as modern and dynamic with an attractive alternative cultural offer28. This last aspect is especially because of the digital arts - Ars Electronica still is considered to be alternative culture. The polls show that the self perception of the people in Linz is highly associated with Ars Electronica and with culture as well as with industry. Over the course of the years, the top-down implemented cultural identity has become a natural identity and so the program that was started 30 years ago can be regarded as very successful.

Conclusion

Ars Electronica has certainly had a deep impact on the city's cultural development, but somehow still remains a friendly alien within the city. The concepts of Avant-Garde and futurism are not meaningful for the working class mentality of Linz, but have come to live in peaceful coexistence. In the years since Ars started, a very active and attractive alternative Media Art and culture scene has grown; with the Interface Cultures program, the offers of the local art university have expanded into Media Arts as well.

Where elsewhere you may hear art historians musing whether Media Art ever existed, in Linz it is much more regarded as an environment than a tool. Over the course of 30 years it has become omnipresent. ìCulture for allî remains on to be the motto for politicians and is manifested in a range of free (digital, mainstream) art festivals and activities in the Open Source sector. Linz, despite being a small city, has a high density of digital art in many different facets. It must be acknowledged that the fact that Ars Electronica and therefore digital arts have been accepted as a naturally developed culture in Linz, although it was a top-down implementation. Part of this success is the ìculture for allî-approach. On the other hand: The event-like character of so many Ars projects might in part also be due to this and sometimes results in productions of doubtful artistic relevance.

Ars Electronica definitely and most influentially changed the cultural identity of Linz and put a unique trademark on it, that is both internationally and locally recognized

NOTES

1 The Art University of Linz, history: http://www.ufg.ac.at/index.php?id=1237&L=1
2 See for example: http://www.linz.at/english/culture/4678.asp
3 From an unpublished interview with Christine Schöpf, May 19th, 2008
4 Summarized from the above mentioned, unpublished interview with Christine Schöpf, May 19th, 2008
5 http://www.aec.at/festival_about_en.php

6 From an unpublished interview with Christine Schöpf, May 19th, 2008
7 http://90.146.8.18/de/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=9503 (German only)
8 http://90.146.8.18/en/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=9324
9 http://90.146.8.18/en/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=9378 and http://90.146.8.18/de/archiv_files/19821/1982_058.pdf
10 http://www.servus.at/VERSORGER/67/music.html
11 http://90.146.8.18/de/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=9418 (German only)
12 http://90.146.8.18/de/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=9417 (German only)
13 http://90.146.8.18/de/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=9402 (German only)
14 http://90.146.8.18/en/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=8906
15 http://www.servus.at/stwst/kunst/niemand/niemand2.htm
16 http://90.146.8.18/en/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=11818
17 http://90.146.8.18/en/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=8730
18 http://90.146.8.18/en/archives/prix_archive/prix_projekt.asp?iProjectID=13388
19 http://90.146.8.18/en/archives/festival_archive/festival_catalogs/festival_artikel.asp?iProjectID=12538
20 Stadtwerkstatt: http://stadtwerkstatt.at, Radio FRO: http://www.fro.at/, Time's Up: http://www.timesup.org/, transpublic: http://www.transpublic.at/, KunstRaum Goethestraße: http://www.kunstraum.at/, Social Impact: http://www.social-impact.at, http://servus.at
21 OK Centrum: www.ok-centrum.at, Lentos: www.lentos.at, OÖ Landesgallerie: http://www.landesgalerie.at/de/lg/, Architekturforum: http://www.design-center.at/-6913-1-1-decom-/cms.html, Stifterhaus: http://www.stifter-haus.at/, Designcenter: http://www.design-center.at/-6913-1-1-de-com-/cms.html, Brucknerhaus: http://www.brucknerhaus.at, Kunstuniversität Linz: www.ufg.ac.at
22 From an unpublished interview with Christine Schöpf, May 19th, 2008
23 http://www.linz.at/kultur/Kep/E-start.htm
24 http://www.linz.at/kultur/Kep/E-Profil.htm
25 As recently included in the exhibition "Stadt im Glück": http://www.stadt-im-glueck.at/text/20
26 http://www.stadt-im-glueck.at/sites/www.stadt-im-glueck.at/files/images/C_1_2_12_web.jpg
27 http://www.stadt-im-glueck.at/sites/www.stadt-im-glueck.at/files/images/C_1_2_13_web.jpg , section ìtechnology and industryî
28 http://www.stadt-im-glueck.at/sites/www.stadt-im-glueck.at/files/images/C_1_2_13_web.jpg , section ìmodernity and dynamicsî

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A New Performativity : Wearables and Body-Devices

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ABSTRACT
In their relatively short history, wearables and body-devices have evolved from cyborg-like extensions and utilitarian solutions aimed at enhancing efficiency, to poetic representations and experiences that give form to the imagination through indirect and abstract transformations. These new body-artefacts, in particular those that directly consider the body's capacity for movement, afford a new kind of performativity that is as much experiential as it is representational. By engaging in an embodied, pre-verbal discourse such works encourage observer empathy in a way that shifts from traditional performance forms such as dance and theatre. Observer can be interactor and roles of performer and audience are blurred or no longer apply. This article examines the emergence of this new performativity. The works cited are examined in relation to Heideggerian notions of poeisis and exstasis, poeticisation and enchantment. An analysis of the evolution of wearables and body-devices in relation to their inherent performativity has been lacking. This article addresses this gap.

KEYWORDS
Performativity, poiesis, enchantment, transformables, body-devices

CHARTING THE ORIGINS

By charting the evolution of wearables and body devices from their cyborg-like beginnings through to contemporary art-design hybrids, we can track the emergence of a new performativity. Wearables and body-devices now engage people critically and imaginatively, through an embodied discourse, situated more often than not in the everyday. This article discusses what this might mean, and how it has occurred.

When people think of early wearables and body-devices they usually go immediately to the iconic images of Steve Mann wearing head-mounted displays (Mann 1980-). While Mann was not the first to be working in this area, and technologies, of course, don't have to be digital, these images remain an enduring reminder of the elision between "wearables", computers, body-devices and the cyborg, as best exemplified today perhaps by the work of artists such as Stelarc (Stelarc 1996 -) and Marcel.lí Antunez (Antunez 1998, 2003), or, as critically brought to mind by works such as Nicky Assmann's *Circuit Dress (Assmann 2008)*, or Noriko Yamaguchi's *Keiti Girl* (Yamaguchi 2004).

The term "Cyborg" was coined in 1960 to describe a human being augmented with technological "attachments"(Clynes 1995). The first wearable computers were typically computers and computer components worn on the body (Rhodes -1997). The people developing them were computer scientists and engineers, and the broader aesthetics of what they were making and presenting were rarely considered in any depth – development of the technology necessarily took precedence. Nonetheless, early images of scientists wearing computers are quite theatrical. They hook into images from science fiction, and connect to our collective dreams of the future as exemplified in Gibson's Neuromancer (Gibson 1984), the Terminator film series (Cameron 1984, 1991; Mostow 2003; McG 2009) and the film Minority Report (Spielberg 2002).

There are now too many examples of wearables and body-devices developed by computer scientists and engineers to mention them all. They still, predominantly, focus on technological development - enhancing functionality and increasing efficiency, and largely ignore broader aesthetic concerns. In recent years though, this has begun to shift as researchers in the field of Human Computer Interaction (HCI) acknowledge the importance of human values and emotions (Gaver 2002, 2003, 2006), as engineering and computer science dominated conferences such as the IEEE's International Symposium for Wearable Computing (IEEE 1997-)

begin to embrace “art” and “fashion” projects, and with the growing prominence of Interaction Design as a field. While all of this is encouraging, and acknowledges the important contribution that aesthetics can give to the experience of all facets of life, and while prominent companies such as Philips, IDEO, Levis, etc. are making significant efforts to make wearables and body-devices that engage our imagination, as McCarthy points out, the results are often not “enchanting” (McCarthy 2006).

I suggest that engagement with these works remains intellectual in many cases because it remains static, and it is through the dynamic of ongoing physical narrative that we experience embodied engagement. The primary concern of this article is how wearables and body-devices have led to the emergence of a new performativity. I believe this new performativity to be intimately linked with embodied, poetic responses to everyday situations. In the following sections I discuss what I mean by this, why I believe this is so and how I believe it has come about.

DEMOCRACY! - FROM THE LAB TO THE PEOPLE

In the early 1990’s postgraduate courses such as Computer Related Design (CRD) at the Royal College of Art in London (now Design Interactions (RCA)) and ITP, the Interactive Telecommunications Program at New York University Tisch School of the Arts (NYU), gave students from disciplines other than computer science and engineering access to micro-computing in what can be seen as a radical democratisation of computing technologies. Both of these institutions taught Physical Computing – “an approach to learning how humans communicate through computers that starts by considering how humans express themselves physically” (Igoe). The technology was central to this enquiry, certainly, but the thinking was focused on human needs and desires, as well as human physicality. The result was an explosive and dynamic exploration of more creative and socially engaged applications of computing technology than anything previously (and arguably still) offered by the scientific research laboratories. Works could be rough and ready, prototyped in a matter of weeks, or highly developed and sophisticated – conceptually and aesthetically refined. They often examined radically different modes of engagement, as will be discussed in the examples below. Not all of the works were or are wearable, but there has been increasing interest in body worn devices, not just for dance, performance or fashion, but for other more experimental and exploratory forms including conceptual propositions and performance interventions.

THE BREADTH OF THE FIELD

Wearables and body-devices today are made by practitioners from a broad range of disciplines and backgrounds, and are informed by a vast range of viewpoints and concerns. They commonly engage with issues beyond fit, functionality and efficient operation to try to enchant people and engage them through their bodies and imaginations. They often do this through performed or performative scenarios grounded in everyday situations.

In general, they can be thought about and categorised in a number of ways:

- works that literally transfer non-body-based technology to the body, transferring button to sleeve, for example, hiding elements in pockets
- works that are closely aligned to traditional approaches to fashion, treating the body as a moving, biomechanically complex coathanger, whose purpose is to transport a body-based artwork, garment or device through space
- works that capitalize on the body’s capacity for movement
- architectural explorations of the extended body space
- socially and critically engaged works
- conceptually challenging/stimulating works
- works destined for everyday life
- works destined for performance and dance
- works that sit in a hybrid space in-between art, design and everyday life
- works with an ongoing narrative
- one-liners – works that perhaps show technical prowess or conceptual acuity but may not be

engaging over time
- works that truly capture us, transport us, challenge the way we think about things beyond the immediacy of the work itself.

This schematisation is neither exhaustive, nor are the categories exclusive, but thinking about wearables and body-devices in this way can be useful to provide a framework for discussion. For the purpose of this article my interest is focused on: works that capitalize on the body's capacity for movement; socially and critically engaged works; conceptually challenging/stimulating works; works that sit in a hybrid space in-between art, design and everyday life; works with an ongoing narrative; and works that truly capture us, transport us, challenge the way we think about things beyond the immediacy of the work itself.

GIVING POETIC FORM TO THE IMAGINATION

Today we find a plethora of wearables and body-devices that embody what I call *poetic* representations and responses to our engagement with the world. The word *poetry* originates from poiesis, which means "making", "creating" or "producing" (Brown 2003). At its origin it was a verb, a word that embodies action and transformation, as well as ongoing narrative experience. Each of these fundamentals are grounded in the body. When Heidegger speaks of *poeisis* he speaks of threshold occasions – moments of *exstasis*, when something transforms from it's being as one thing into another (Heidegger 1962). This suggests an ongoing narrative enabled through an embodied transformation process. Stewart proposes that 'Poetic language' naturally affects the way narrative experiences unfold because it has a descriptive power that makes visible, as it shapes the way we perceive both the landscape of action, and our relationship to that landscape (Stewart 1993).

> If we consider poetry as a form of art in which language is used for its aesthetic and evocative qualities in addition to, or in lieu of, its ostensible meaning and transpose this directly onto body-worn devices and wearables, we can extrapolate the following:
>
> Body-worn devices employ a wide range of languages such as form, texture, colour, time and movement; as well as fashion, technology, architecture, performance and interaction design. These languages can be variously employed for their aesthetic and evocative qualities in addition to, or in lieu of their ostensible meaning.
>
> When discussing the poetics of a work I refer to a conscious employment of aesthetic and evocative qualities rather than any linguistically-based notions of meter or timbre. A deeper discussion of poetics in relation to wearables and body devices is provided elsewhere (Wilde, 2009). I will instead discuss here some works that embody these ideas in different ways to unpack what I mean by this new performativity, and link it to notions of enchantment.

Enchantment

McCarthy states that "when it comes to experiences such as enchantment feelings are as important as thoughts, sensation is as important as cognition, and emotional consciousness is as important as will." (McCarthy 2006). Bennett describes enchantment as being ''both caught up and carried away''. She suggests that the resulting disorientation is associated with a pleasurable sense of fullness and liveliness that charges attention and concentration. The combination of emotional attachment and a sense of something 'not yet understood' leaves us feeling disrupted but also attentive and curious (Bennett 2001). I suggest that an evolving, physically engaged narrative that gives poetic form to the imagination, that is grounded in the everyday yet is presented through performative means can be enchanting.

Performance

Susan Kozel asserts that performance can act as a catalyst for understanding wider social and cultural uses of digital technology, and that performative acts of sharing the body through our digital devices can foster a collaborative construction of new physical states and levels of conscious awareness (Kozel 2008). Performance, when grounded in the everyday, blurs contextual boundaries so enhances these qualities. Both

performer and observer can enter and experiment with pre-verbal relationships, and the observer can readily imagine inserting themselves directly into the narrative, of which they are already, tacitly, a part.

SOME TRANSFORMABLES

Assa Ashuach's *My Trousers*, transform a banal everyday item - a pair of jeans, in an invisible, so miraculous way, into a seat. In doing so they transform the experience of being on crowded public transport where there is inadequate seating into a cheeky and pleasurable, or at least satisfying experience that engages with the surrounding commuters by hooking into their desire for a seat, or their empathic understanding of this desire (Ashuach 2003). Joo Youn Paek's *Self-sustainable Chair*, gives us access over time to the transformation of a dress into a seat. As the wearer of the dress walks a large pocket at the rear inflates, once inflated the wearer can sit and, for example, read a book or make a telephone call. Once sat upon, the dress-chair begins deflating until it can no longer be used as a chair. In order to recreate the chair, the wearer must start walking again (Paek).

The cyclical nature of the relationship between dress and chair is clear and not complex, yet it is still wondrous, as, like jeans, dresses are not normally chairs. Eliding these two, seemingly unrelated articles through movement makes an elision between the stillness normally associated with being seated, and the act of being in motion. It connects to the collective desire for time to sit, reflect and relax while 'charging' through contemporary life, or the desire for small conveniences like a seat when making a phone call, or in the case of *My Trousers*, when on a crowded train, and it does so through physical engagement. This connection, with collective desires or imaginings through the body, allows the viewer to situate themself as a player within the presented narrative. Because the experience is situated in the performer's body, in the same environment as the observer (or an environment that the observer can commonly inhabit) - they can literally, viscerally imagine themselves within the action. This is very different to if the garment were to be presented as an abstract idea, without an embodied narrative.

For example *Jacket/armchair* from Moreno Ferrari's *Transformables* collection for C.P.Company (Ferrari 2001), is neither worn nor presented in a performed scenario, and remains disembodied – the observer engages with it intellectually rather than viscerally. In contrast, Hussein Chalayan's Autumn/Winter 2000 *After Words* collection (Evans et al. 2005), where seat covers become dresses and a wooden coffee table becomes a skirt is presented through a performed narrative. The situation is quite fantastic, and doesn't necessarily respond to a desire or need grounded in the everyday, yet it still seems to capture our imagination as we follow the unfolding narrative and are enchanted each time something unexpected transpires. With this work Chalayan opens up new areas of exploration as he elides fashion design with performance and architecture.

Mary Hale's *Monumental Helium-Inflatable, Wearable, Floating Body Mass* (Hale 2008), in which a pair of trousers inflate to release you from the pressures of gravity, takes visceral experience and embodied interaction into a completely fictional space. Yet observer can still empathise as the desire to be released from the pressures of gravity (i.e. life) is strong, and our ability to imagine what it must feel like when we see Hale wearing the *Body Mass* is afforded by the blissful look on her face as she floats in an impossible mass of air. The zero gravity and weightlessness afforded by *Body Mass* also connects to romantic associations and collective dreams of a brighter future associated with space travel, bringing us back, surprisingly, to the initial cyborg-like associations of early wearables and science fiction, but in a contemporary, abstracted and poetic way.

In a different kind of abstraction Di Mainstone andV2's *ShareWear* (Di Mainstone 2008) involves a pair of identical twins who dress each other in a series of modular objects to redefine their silhouettes and blur the boundaries between clothing, a sofa and lamps. The resulting outfits can connect to each other, and be interacted with, to illuminate in a number of different ways. The body is engaged in the construction process, and to effectuate the necessary displacement to trigger the different lighting effects, but there is no emotional or visceral engagement on the part of the performers. This work has little to do with everyday desires on

the surface, yet the concatenation of everyday objects and actions gives us something to hold onto, to relate to, to ground what we are observing in personal experience, so, despite the abstracted nature of the twins' engagement, the unfolding narrative is still intriguing because of the unexpected yet strangely logical outcomes as the object-dresses are built and operated. Unlike previous works though, the observer does not place themselves in the *ShareWear* narrative. The quality of the twins' engagement seems key to this, as does the distancing of context from the observer. The meaning or motivation behind the performers' actions distances the observer as there seems to be no emotional or sensual engagement with which to connect.

MOVEMENT AS A TRIGGER FOR THE IMAGINATION

Leissler's *Sole-on*-ice is a pair of sandals that can be placed in the freezer to develop thick ice-blocks on their sole to become a composite 'shoe/frozen surface' object for skating (Leissler 2007). Once the ice is melts, they have to be put back in the freezer, so the process can begin again. Similar to *Self-sustaining Chair*, the transformation process of *Sole-on*-ice is simple and cyclical, yet it is also enchanting. It connects to reminiscent dreams of childhood and also fairy-tales. Bettelheim says that a fairy tale's enchantment depends on the child's not quite knowing why he or she is delighted by it (Bettelheim 1973). I suggest that embodied engagement is key.

Grace Kim's *Twirl Skirt* (Kim 2005) is another work that reconnects us with our childhood – a simple yet dynamic example of how movement can inspire and captivate. *Twirl Skirt* is a skirt with an accelerometer in the waistband and three electro-luminescent panels that light up in response the wearer's acceleration. Forty year old women put the skirt on and spin like they haven't done since they were eight years old. The work is unquestionably enchanting.

A more fantastical example is *hipDisk*, a self-contained wearable sonic output system for performance and play that exploits changing relationships between torso and hip to actuate simple tones. (Wilde, 2008) The *hipDisk* provides a startlingly different view of the body, challenges traditional representational aesthetics and provokes new ways of moving. The resulting shifts in perspective afford new ways of thinking about the body and movement, as well as sound production and composition, and provokes creation and reflection upon new modes and patterns of bodily experience. The interface allows us to enter and experiment with pre-verbal relationships to space and sound and renders accessible our gestural engagement with them, in an ongoing process. All of these things, facilitated by the interaction between body-movement, interface, and the effects of technology, combine to embody a poetic extension of the dynamic moving form.

Finally, Riita Ikonen's work, which anthropomorphises snowflakes, leaves and nylon, to place their embodied fantastical forms in everyday situations (Ikonen 2007, 2007-, 2005) imbues inanimate objects with human emotions to encourage empathic engagement. In *Human Nylon* Ikonen situates herself as 'nylon' in its various forms, in various points along the product's lifecycle. *Snowflake* is a costume that turns her into a stranded human snowflake to bring attention to the recent lack of snow in Finland at Christmas time. *Bird and Leaf* reflects on the artist's sentimental yearning to 'get back to nature'. A yearning that is easily recognisable.

CONCLUSION: **A PERFORMATIVE PRE-VERBAL DISCOURSE**

The works cited are neither clearly art, nor design, nor performance, yet somehow blur the artificial boundaries that often separate such disciplines. Whether a work is embedded in the everyday or not, the performative nature of the works' presentation – the embodied revelation of an experiential narrative – seems to engender an empathic connection in the observer different to that experienced through traditional forms of performance. The wearers of the artefacts are commonly part of the same unfolding narrative as the observers, though they embody their responses to the narrative in a different, highly poetic way. Doing so connects to collective desires – to go places but also sometimes to stop and pass time in a reflective activity; to engage in playful distractions, or collective dreams; to 'step out of' everyday life into a more embodied, poetic existence. This new performativity seems an important development afforded by wearables and body-devices, which, if taken on board by scientists and technologists, could result in radical developments in the field.

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The Relocation of Theatre: Making *UNMAKEABLELOVE*

Jeffrey Shaw and Sarah Kenderdine

Abstract This paper addresses the histories of liveness and performance and of the life of machines by articulating theoretical positions on Samuel Beckett's prose work *The Lost Ones* in relation to a recent new media work *UNMAKEABLELOVE* (Kenderdine and Shaw, 2008). Beckett's prose has been interpreted by a number of leading scholars including Lyotard ('systematic madness'), Schwab ('soul-making') and Porush (Beckett's 'cybernetic machine') who envision the texts' narrative agency as 'a disembodied artificial intelligence' exploring the boundaries between the human and post-human. This paper examines these topics through references to the histories of Automaton Theater, figurative actors, computational agents, the pioneering interactive installation *POINTS OF VIEW* (Shaw, 1983) and the seminal Mabou Mines theatrical production of *The Lost Ones* (1975). *UNMAKEABLELOVE* advances the practices of algorithmic agency, artificial life, virtual communities, human computer interaction, augmented virtuality, mixed reality, multimedia performance to engage 'the body's primordial inscriptions' (Schwab, 2000, p. 16). It focuses and makes interactively tangible a state of confrontation and interpolation between our selves and a virtual society that is operating in a severe state of physical and psychological entropy. Its mixed reality strategies of embodied simulation intricately engage the presence and agency of the viewer, and impel them to experience the anomalies of a perceptual disequilibrium that directly implicates them in an alienated and claustrophobic situation.

Keywords media art, automaton, theatre, virtual communities, Beckett, cybernetic, interactive 'We need machines that suffer from the burden of their memory' (Lyotard, 1991, p. 22).

Automaton Theater Figurines were amongst the earliest signs of human culture, and in thinking about the histories of the life of machines it may well be that the first figurines imbued with agency (automatons) were the Egyptian *shabti* depicting servants engaged in different tasks, equipped with hoes, grain baskets and other necessary tools, who would continue to work for the wealthy and powerful in the netherworld. During the period of the Alexandrian school, Heron of Alexandria produced a number of manuscripts including The Automaton Theater that describes a puppet theater controlled by strings, drums and weights. Mechanical, hydraulic and pneumatic automatons then continued to be developed in medieval times in Europe and the Indian subcontinent. In the notebooks of Villard de Honnecourt we encounter an enduring theme associated with the entire history of automata, the notion of a perpetual motion machine – a machine that could run itself for an infinite period. Hydraulics, magnetism and alchemy were variously considered as the likely source of such an inexhaustible and/or renewable energy source (Nocks, 2007, pp. 4–19). 'It is chance that is infinite, not god' (Artaud, 1965).

With the invention of computing machines a pseudo perpetual motion apparatus has come into existence with the capacity to render an 'automaton theatre' that is artificially enlivened by the software algorithms, imbuing its virtual fabrications with agency. This circumstance allowed *UNMAKEABLELOVE*1 (Figure 1) to undertake a reconsideration of the nature of automatic theatre, and of the existential dilemma's that can be entertained within its realms of simulations and human interaction. Computers also redefined the nature of interactivity between humans and machines, and works like *POINTS OF VIEW*2 were able to convert that into a means of theatrical expression.

POINTS OF VIEW

POINTS OF VIEW was an experiment in computational theatre that espoused real time three-dimensional computer graphics and the extended space of real time flight simulation as a dramatic and appropriate domain for artistic formulations and theatrical expression. In the late 70's Bruce Artwick developed the Flight Simulator, one of the first popular game engines that has become the longest running PC game series of all time (Artwick 1975). Early on this game engine only permitted about one hundred low-resolution straight monochrome lines to be drawn, yet by engaging its potentialities and constraints, *POINTS OF VIEW*

could configure an interactive audiovisual three-dimensional virtual world that the viewer was able to freely navigate in real time.

Edward Gordon Craig in his 1905 essay *The Actor and the Über-Marionette* called for 'a new form of acting, consisting for the main part of symbolic gesture' (Craig, 1905 cited in Baugh 2005, p. 104). In *POINTS OF VIEW* Egyptian hieroglyphics function as three-dimensional stick figures, constituting a theatre of linguistic symbols that is video projected onto a large screen in front of a seated audience. One member of the audience using two specially designed joysticks can control the action of the work, moving his virtual point of view within a hemispherical space that contains the visual setting: 360 degrees around the stage, 90 degrees up and down from ground level to aerial view, and forwards and backwards from the centre of the stage. In this work the dramatic scenography has little to do with the movement of the hieroglyphic figurines, but everything to do with the movement of the viewer's point of view with respect to those actors, and it is viewer's virtual movement that constructs the temporal expression of this work's dramaturgy. This is also explicit in the sound design of *POINTS OF VIEW*, where it is not the linguistic symbols on stage who are audible, but rather the commentators who are virtually located in the space that surrounds the stage and their voices are heard by the viewers depending on their proximity to those commentators' positions in the virtual space. These sound tracks are interactively linked to the image via the same joystick that controls the user's visual navigation – it modulates the various voices in relation to the different spatial positions that the user is taking with respect to the stage scene. The mix of sound tracks thus generates an extemporary conjunction of spoken information that is directed at the shifting visual/conceptual juxtapositions of the hieroglyphic figures. *POINTS OF VIEW* construes a navigable virtual theatrical space populated by its virtual figurines whose novel theatrical expression and temporal dramaturgical articulation is precipitated by the actions of the viewer. The notion of a miniature theatre of figurines is also the central dramaturgical construct in Mabou Mine's interpretation of *The Lost Ones,* while *UNMAKEABLELOVE* takes this paradigm further by extending the viewers' modalities of navigation and examination, by enlivening the synthetic actors' space with autonomous agency, and by translating viewer interactivity into viewer complicity.

Mabou Mines' *The Lost Ones*

The New York theatre company Mabou Mines3 are considered one of the foremost interpreters of Samuel Beckett's works. They premiered *The Lost Ones* in 1975, directed by Lee Breuer, designed by Thom Cathcart, performed by David Warrilow and with music by Philip Glass (Figure 3). Richard Gottlieb in the Soho Weekly News remarked 'I've seen many Beckett Hells, but this is the first one I've experienced' (Gottlieb, 1975). Beckett's prose piece opens with stage directions for an eerie scene, evoking, in postmodern abstraction, a space resonating with Dante's Purgatorio:

'Abode where lost bodies roam each searching for its lost one. Vast enough for search to be in vain. Narrow enough for light to be in vain. Inside a flattened cylinder fifty metres round and sixteen high for the sake of harmony' (Beckett, 1972, p. 7).

The Lost Ones, like works by Kafka and Borges, creates a fictional and somewhat fantastic circumstance of constraint and deprivation. It describes a community of about two hundred people who are incarcerated inside a confined space, and the resulting existential tension of these inhabitants' lives. Minutely constructed according to geometrical shapes and measurements, *The Lost Ones* is populated by an abject and languishing people whose culture seems to be organized according to an elusive order, if not an unfamiliar harmony, the principles of which have yet to be discovered (Beckett, 1972. pp. 7-8)

The Mabou Mines' rendition of *The Lost Ones* has become an avant-garde legend, and there are certain aspects that demonstrate strategies of theatrical representation and viewer engagement that, albeit without its new media underpinnings, are synchronous with conceptual and operational methodologies in *UNMAKEABLELOVE*. Cathcart's stage design encompasses the entire theatre and is a specially constructed cylindrical amphitheater in which the audience members sit, so that they are led to focus on their own circumstance and compare their own state of incarceration with that of Beckett's protagonists.

This interpolation of real and fictional space that is a feature of *UNMAKEABLELOVE*'s mixed reality, is a tactic that 'puts us in (the play's) own state of ontological estrangement' (Kalb, 1989, p. 139). Mabou Mines' production also follows the traditions of the theatre of automatons by articulating its representation of The Lost Ones' environment and characters as a small architectural model inhabited by tiny centimeter-high stick figures. These figures are manipulated by the production's single actor/narrator who dramatizes his narrative telling of their predicament. In anticipation of the optical immersion afforded by virtual reality technologies, the audience members are each given opera glasses so that they can peer into this micro-world and lose themselves in its estranged imaginary. But like UNMAKEABLOVE, immersive engagement is directly accompanied by techniques that shift the symmetry of real and virtual ontologies into a theatrical condition of paradoxical confrontation that implies the complicity of the viewer. For example, both productions exploit lighting to this effect. *UNMAKEABLELOVE*'s totally darkened space only becomes perceptible via the torch beams that are directed by the viewer's, while at one point in the Mabou Mines' production, the single hanging lamp that illuminates the performance suddenly switches off and plunges everything including the audience into a shared state of pitch darkness. Then as the actor 'speaks his final anecdote to a toy figure balanced on his knee, illuminating it with a penlight, apparently dispending with distinctions amongst contexts, questions arise to threaten to throw all mimetic readings into confusion' (Kalb, 1989, p. 138). These 'vacillations of identities and contexts' (Kalb, 1989, p. 138) is key to both undertakings.

Re-Actor

The history of the cinematic experience is a rich chronicle of viewing and projection machines. Before Hollywood imposed its set of ubiquitous formats, there were a myriad of extraordinary devices, like the Lumiere Brothers Photodrama, the Cyclorama, Cosmorama, Kineorama, Neorama, Uranorama and many more. The Kaiserpanorama – a stereoscopic cylindrical peepshow – is an especially relevant forerunner of a newly configured display system, Re-Actor.

In 1911, Franz Kafka saw a Kaiserpanorama and wrote: '...the scenes [are] more alive than in the cinematograph [ ] because they allow the eye the stillness of reality. The cinematograph lends the observed objects the agitation of their movements, the stillness of the gaze seems more important. Smooth floors of the cathedrals in front of our tongue' (Kafka cited in Zischler, 2003, p. 25).

David Trotter, media theorist, takes note of Kafka's appreciation of the scene's qualities of 'tactility'. The images are indeed tactile in the specific ways found only in immersive architectures and through stereographic materials. As a machine for reformulating theatre, Re-Actor also resonates with Edward Gordon Craig's 1907 patented radical stage architecture of 'screens' (Figure 5) that set out to transform the 'false scene' of theatre into a 'real place' (Baugh, 2005, pp. 54-55).

Re-Actor (Figures 6 & 7) evolved from Museum Victoria's highly successful Virtual Room4 (Kenderdine & Hart 2003) and the uniqueness of this system was its ability to conjure a persuasive and coherent three-dimensional virtual reality within an architectonic enclosure that the audience could freely circulate around and gaze into. Re-Actor's six rear-projected screens use twelve projectors, passive Polaroid filters and glasses for stereoscopic three-dimensional viewing. It is operated by six workstations that are connected to six pairs of 1050 x 1400 pixel Projectiondesign DLP projectors. The *UNMAKEABLELOVE* installation also has six custom-made torch-interfaces that are positioned in front of each screen and six infrared video cameras are positioned above each screen. These torches enable the visitors to peer into the virtual world; their virtual light beams intersect and illuminate the computergenerated figures that inhabit its virtually represented interior (Figure 8).

UNMAKEABLELOVE in Re-Actor offers a physically immersive three-dimensional space of representation that constitutes an augmentation and amalgamation of real and virtual realities. It is a hybrid location-based manifestation that operates both as an individual and socially shared experience, and its interactive modalities of operation incorporate the kinaesthetic dimensions of human apprehension to establish a 4 The Virtual Room <http://www.vroom.org.au>. Last accessed 16 June 2009. congruence of human and machine

agency. To explicitly articulate the conjunction between the real and virtual spaces in this work, the viewer's virtual torch beams penetrate through the container and illuminate other viewers who are standing opposite them on other sides of the installation. This augmented reality is achieved using infra-red cameras that are positioned on each screen pointing at its respective torch operators, and the video images are rendered in real time onto each viewer's screen so as to create the semblance of illuminating the persons opposite them. The resulting ambiguity experienced between the actual and rendered reality of the viewers' presences in this installation, reinforces the perceptual and psychological tensions between 'self' and 'other'. David Porush in 'Deconstructing the machine: Beckett's *The Lost Ones*' (1985) perceives the cylinder as an enormous cybernetic machine controlled from some outside source. In UNAMAKEABLELOVE 'control' is both illusive and made more explicit. Participants operate through the sensorium of interaction with Re-Actor, its inhabitants and each other. The space that opens: '...facilitates the emergence of hitherto unimagined visions and sensations that exert a unique appeal to the senses and generate an intense cathexis' (Schwab, 2000, p. 73).

Making UNMAKEABLOVE

The Lost Ones describes a community of about 200 people who inhabit a cylinder that is 50 meters in diameter and 18 meters high. In *UNMAKEABLELOVE* this is scaled down to 30 characters that inhabit Re-Actor's hexagonally shaped room that is 5.5 meters wide and 3.5 meters high. To reflect the body to space ratio that Beckett proposes, its characters are reduced to approximately half life-size. Three actors performed over 300 motion-captured sequences that became the primary resources for the real-time behaviors of the characters in *UNMAKEABLELOVE*. Each character is a 12,000 triangle polygonal model with a 1024 x 1024 pixel texture and is animated by a 53-bone skeleton. Real-time rendering of the characters using the Microsoft XNA game engine allows for dynamic lighting, controlled by the viewers. Six volumetric light beams, casting shadows onto each other and the environment, light the characters.

The almost scientific exactitude of Beckett's text enables it to be analyzed and coded into software algorithms that can then computationally animate virtual representations of his characters. In *UNMAKEABLELOVE* these virtual representations then become the seemingly self-motivated narrative agents of Beckett's scenario. The world of *UNMAKEABLELOVE* consists of the Searchers who are always active and searching in vain; the Sedentary who no longer move around and are only occasionally roused from their lethargy, and the Defeated for whom all hope is gone, slumped and vaguely stirring in the perimeter of the enclosure. Each group with their specific behaviors is largely confined to particular zones inside the hexagonal space and permitted occasional interactions, moving between zones. Violence sporadically breaks out, and now and then they collide in a frenzied sexual encounter. The narrative agency in *The Lost Ones* has been described as a 'disembodied artificial intelligence' (Schwab, 2000, p. 61). One can imagine its denizens as inhabiting a posthuman space, the last humans secluded in a capsule that is, like a nautilus, organized according to a 'self sufficient cosmogony, which has its own categories, its own time, space, fulfilment and even existential principle' (Barthes, 1972, p. 65).

UNMAKEABLELOVE advances the practices of algorithmic agency, artificial life, virtual communities, human computer interaction, augmented virtuality, mixed reality and multimedia performance in a 'polyaesthetic' experience to 'engage the body's primordial inscriptions' (Schwab, 2000, p. 16). It locates Beckett's society of 'lost ones' in a virtual space that represents a severe state of physical and psychological entropy, evoking perhaps a prison, an asylum, a detention camp, or a dystopian Brig Brother show '...the condition of the human at its ultimate vanishing point...' (Schwab, 2000, p. 73). The inhabitants of Beckett's cylindrical space are oblivious to their condition, and we the viewers of their world, with our probing torch lights and prying gaze, are positioned as the 'other' and forced to experience the anomalies of a perceptual disequilibrium that implicates us in this alienated narrative. The resulting ambiguity reinforces a perceptual and psychological tension between 'self' and 'other' generated by the works' mixed reality strategies of embodied simulation that intricately engage the presence, agency and complicity of the viewer.

'There must be no let up, no vacuum in the audience's mind or sensitivity…' (Artaud, 1985, p. 84).

Following from Artaud, Marinetti, and Brecht, *UNMAKEABLELOVE* reframes the central role of audience in theatrical experimentation, but rather than the convivial participations described in *Relational Aesthetics* (Bourriaud, 2002), *UNMAKEABLELOVE* alludes to more troubled evidence of audience behaviour such as the violences that it perpetrated in the Living Theater's *Paradise Now!* (Avignon Festival 1968) and Marina Abramowic's *Rhythm O* (Studio Morra, Naples, 1974). Facing up to this latent pathology, Terry O'Connor, an actor in Forced Entertainment's *Showtime* (Alsager Arts Centre, Stoke-on-Trent 1996) suddenly shouts at the audience: 'What the fuck are you looking at? What the fuck is your problem? Fuck off! Voyeurs! There's a fucking line and you've just crossed it. Where's your human decency?' (Etchells, 1999 cited in Freshwater, 2009, p. 52). *UNMAKEABLELOVE* interpolates two scenarios for this loss of human decency – one that is evoked in Beckett's existential endgame *The Lost Ones*, and the other that confronts the viewer/ voyeur with the explicit experience that they are complicit in both the origin and outcome of this endgame. It is a spectrum that ranges between interpersonal sadism, refugee brutality, and environmental defilement. Conjoined in the narrative extremity of Beckett's *The Lost Ones*, *UNMAKEABLELOVE*'s computational scenography exposes that 'What is tragic is not the impossibility, but the necessity of repetition' (Derrida, 1978, cited in Scheer 2004, p. 44). *UNMAKEABLELOVE*'s torch-lit metaverse correlates with Susan Sontag's observations on Artuad's view of shadows and spectacles.

'Artaud thinks that modern consciousness suffers from a lack of shadows. The remedy is not to remain in (Plato's) cave but devise better spectacles. The theatre that Artaud proposes will serve consciousness by 'naming and directing shadows' and destroying the 'false shadows' to 'prepare the way for a new generation of shadows' around which will assemble 'the true spectacle of life'. It will be a stage of extreme austerity dominated by the 'physics of the absolute gesture, which is itself idea'' (Sontag, 1980, cited in Scheer, 2004 p. 88).

Here the rigour of an algorithmically defined and simulated universe of prescribed emergent behaviours aligns with Artaud's contempt for dramatic performativity: '…the uselessness of the action, which, once done, is not to be done, and the superior use of the state unused by the action, and which *restored* produces a purification' (Artaud, 1958). *UNMAKEABLELOVE*'s actors do not strike poses or construct gestures, they respond to events out of computational necessity. As in the Purgatorio, gloominess and indifference periodically lead to 'zeal and fervent affection', and now and then Beckett's vanquished resurrect to perform vain attempts at copulation. In *UNMAKEABLELOVE*, lovers are caught in desiccated bodies whose 'hampering effect on the work of love' condemns them to perform a grotesque spectacle of 'making unmakeable love' (Beckett, 1972, p. 37). Understood as a 'glittering' space of 'cryptic incorporation' (Perniola, 2000. p. 69), *UNMAKEABLELOVE*'s foreverautomated post-human universe is driven by a '… gratuitous and baseless necessity'.

'To think the closure of representation is to think the tragic: not as the representation of fate, but as the fate of representation. And it is to think why it is *fatal* that, in its closure, representation continues.' (Derrida, 1967, cited in Scheer, 2004, p. 46).

Notes

1 UNMAKEABLELOVE Sarah Kenderdine and Jeffrey Shaw (eArts, Shanghai 2008). See <http://unmakeablelove.org>. Last accessed 16 June 2009.

2 POINTS OF VIEW, Jeffrey Shaw (Mickery Theatre, Amsterdam 1983). See <http://www.jeffreyshaw.net/html_main/show_work.php3?record_id=67>. Last accessed 16 June 2009.

3 Mabou Mines. See <http://www.maboumines.org>. Last accessed 13th September 2009

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Art-Science connections for the visualisation of minerals: historical precedents for media arts

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Abstract
The Making of Rocks: 'By what furnaces of fire the adamant was melted, and by what wheels of earthquake it was torn, and by what teeth of glacier and weight of sea-waves it was engraven and finished into its perfect form, we may perhaps hereafter endeavour to conjecture.' [John Ruskin, Modern Painters, vol iv. part v. ch. vii, § 2.]
Visualisation is a complex process for artists and scientists. In both science and art visualisation can refer to objects that have material existence, or the visualisation can be a representation of conceptual or abstract phenomena. One area where there is a rich history of both representation and conceptualisation relevant to a critical understanding of current media arts is in the visualisation of rocks and minerals. This paper will discuss historical examples from the arts and design of the 19th and 20th centuries as the background for considering actual and potential synergies in present day arts-science collaborations that explore visualisation within the earth sciences and specifically mineralogy and crystallography.
This will include reference to current theoretical approaches to visualisation where knowledge building, the expressive potential of visualisation of data, and consideration of visual representations and models as tools and mediators are integral to the complexity of our visual culture.
Keywords
Visualisation, modelling, mineralogy, crystallography, collaboration

Introduction

Scientists, artists, and clerks have been multiplying imageries, intermediaries, mediations, representations while tearing them down and resurrecting them with even more forceful, beautiful, inspired, objective forms (Latour and Weibel 2005, 26).

This paper considers the historical context of the communication of mining cultural heritage and its relationship to new media art, specifically work that builds on arts-science relationships. Mining is a truly global phenomena underpinning industrial development and includes both simple and sophisticated technologies, and pure and applied research. Mining has a rich heritage of knowledge, skills and cultural association – scientific, technological and creative. It also has a cultural heritage that can be transient and disappear almost without trace; or mining activities can leave scars of desolation and pollution within communities and landscapes once corporations have exhausted the resources found in those locations

I will first consider contributions to the visualisation of rocks and minerals from the late 18th century to the 20th century, to contextualise specific relationships between science and art. I will then discuss recent works by artists whose practice provides an understanding and appreciation of certain aspects of minerals and mining; either as an exploited resource, as in the case of works linked to mining heritage, or by those who have explored aspects of minerals such as elements, chemical composition, structure or related geological processes of rock formation.

This is a rich area for exploration literally in terms of its potential for considering the scale of things. It is possible to link minerals to rock formations and geological processes over vast tracts of time. Conversely, it is possible to move from minerals and crystalline structures to the nano-scale.

This overview will show specific synergies and connections between the sciences and the arts, where there is a transition across 'disciplines' as they are developed to provide knowledge and understanding of the Earth. Some of these are smooth transitions and translations, based on similar aims and objectives, or dependent on the use of the same tools and techniques; others are intellectually charged experiments to cross, what at the time, were conceived of as separate 'cultures'.

Visualisation
In existing accounts of visualisation more broadly, Martin Kemp has described a broad sweep across 'structural intuitions', with artists (old master, modern and present) moving from a consideration of analytical description, to abstraction and then to process (Kemp 1998, 875). This means a change from creating a visualisation from an exterior viewpoint to interpreting, constructing and codifying data beyond the reach of bodily senses.

There are specific technologies that have enabled this to happen. Not only have images become more dominant for communication during 20th and 21st centuries (Stafford) but digital forms of visualisation have also become increasingly complex with the development of visual analytics. This discipline is concerned with sensemaking and reasoning (NVAC™ 2004) and is facilitated by interactive visual interfaces. It is a means of synthesising from large datasets, often with conflicting and ambiguous data.

Current developments in visualisation are places in two broad categories - scientific visualisation and information visualisation (Charters 2008). Scientific visualisation is concerned with the conversion of numeric data usually from scientific experiments and simulations, to a graphical representation and mostly deals with data that has a natural geometric structure (e.g., MRI data, wind flows). Information visualisation is a conversion of other forms of data, such as structured and unstructured text, images and video to an appropriate graphic representation. The term 'information visualisation' was coined by Stuart K. Card, Jock D. Mackinlay and George G. Robertson in 1989 (Card et al 1998, 8). Media artists have made use of the software and architectures and associated technologies for works that can be networked, have novel interfaces and can be immersive, interactive, and simulations.

Visualisation of minerals and rocks – art science relationships
I will now consider contributions to the visualisation of rocks and minerals from the late 18th century to the 20th century, to contextualise specific relationships between science and art and the associated access and development of tools and technologies for visualisation.

In 'Art History as the History of Crystallography' James Elkins has raised questions about the expressive meaning of art where images convey 'personal, political, social, psychological, gendered, or other kinds of meaning that artists can more or less freely incorporate into their works' (Elkins 1999, 13). He uses art history's interpretive protocols to provide a visual analysis of crystallography drawing techniques to argue that one of the main movements in crystallography is from 'haphazard naturalism towards geometric abstraction' thus giving an account of a change around 1800 similar to Kemp's category of abstraction. This move to abstraction is further evident in the adoption of clinographic projection, which was universally accepted by the 1880s, or in gnomonic or stereographic projection; the skills for reading these projections are not 'natural' and have to be learnt (Elkins 1999, 20). Interestingly, Elkins raises various historiographical issues; one being that of appropriate explanation, referring to how much specific technical information is relevant for explaining scientific images (Elkins 1999, 14). If discussing pictorial analysis this is an important issue, but as well as linking to the technical, artistic links to mineralogy also lead to cultural meaning, as shown in the following examples which are concerned with the social circulation of images.

My specific historical examples are:
The collection of the late 18th century mineralogist Philip Rashleigh, where illustration was used to communicate and circulate a concern of science.
The critical writing of the 19th century art critic and geologist, John Ruskin, where scientific knowledge was integral to the appreciation of art and the study of mineralogy and geology was used for ethical instruction.
The display of the periodic table at the Festival of Britain of 1951, where science was de-mystified for democratically educational purposes.

Philip Rashleigh
Philip Rashleigh (1729-1811) was a Cornish antiquarian and mineralogist who obtained mineral specimens from the local miners and built up a collection of Cornish minerals that was widely consulted by visitors

during his lifetime. Similar to other collectors at the time, he also built up his own system of classification. The collection passed to a nephew until it became part of the collection in the Royal Cornwall Museum in Truro in 1902. Besides building the collection, Rashleigh put great effort into producing two books of accurate illustrations of the chosen specimens, especially their natural colour. His contribution to mineralogy therefore shows a concern for communication science and making the information visible for circulation and appreciation. (It is still possible to compare actual specimens with the illustrations in the museum display.) He meticulously catalogued his collection, with attention to locality information, which shows the strength of links to the mining industry in Cornwall as did his attempt to collect every variety of tin from Cornwall and elsewhere. Rashleigh did not become proficient in chemical analysis as practiced by some of his contemporaries. He wrote in 1804 'all my knowledge of Chemestry [sic] is so antiquated' (Cleevely 2000, 94).

His contemporaries like the Swedish mineralogist, Axel Fredrik Cronstedt (1722 -1765), developed the use of a blowpipe for analysing the composition and chemistry of minerals. This technique was combined with the work of René Haüy in 1801 to show that crystals cleaved along specific faces, fixed by underlying crystal symmetries. Haüy is considered to be the principle founder of crystallography (Greenberg 2003, 136). Then the combination of chemical and physical analyses culminated in American mineralogist, James Dwight Dana proposing a chemical classification in 1837 that remained functional until scientific advances showed that materials could no longer be compartmentalised according their origin on Earth, other planets, the product of human manufacture or as organic-inorganic (Hemley 1999, 1026).

John Ruskin

Ruskin (1819-1900) was a pupil of Rev. William Buckland (1784–1856) at Oxford. Buckland's theories kept geology in tune with Biblical accounts of creation and were an influence on the young Ruskin, who became a Fellow of the Geological Society of London in 1840. Ruskin's love of geology and in particular the formation and decay of mountains was an important part of his discussion of art in *Modern Painters*. The five volumes, written between 1843 and 1860, showed his appreciation of Turner textually woven with his love of landscape and mountains. Although Ruskin suggested that a geologist could look at a Turner painting and see enough detail to give a lecture on the rock types and formations he also considered that Turner's power was in his ability to create 'not so much the image of the place itself, as the spirit of the place' (Grieve 1996, 230).

Ruskin also considered exaggeration to be necessary for depicting what was important but subtle in nature (Grieve 1996, 232). For Ruskin 'good art rarely imitates' it usually only describes or explains and consisted of 'First, the observation of fact; secondly, the manifesting of human design and authority in the way that fact is told. Great and good art must unite the two; it cannot exist for a moment but in their unity' (Clark 1967, 150). Through his writing, Ruskin was capable of a 'level of close tactile analysis and intense politico-social engagement, sustained by an incomparable verbal re-evocation of artistic experience – ekphrasis' (Kite 2007, 180). Ruskin's achievement was to make the reader feel like a participant in the visual experience he was describing.

In *The Ethics of the Dust*, published in 1866, Ruskin demonstrated that the study of crystallography might teach social reform, political economy, and virtue as well as science. In answer to a question posed in one of the book's lectures: 'Then we may really believe that the mountains are living?' The lecturer replied: You may at least earnestly believe, that the presence of the spirit which culminates in your own life, shows itself in dawning, wherever the dust of the earth begins to assume any orderly and lovely state.' (Ruskin 1877, 211). Ruskin was able to use mineralogy to make connections between the physical world and morality.

Festival of Britain, 1951

The periodic table of the chemical elements is a tabular form of displaying the chemical elements. It is a useful framework for classifying, systematising and comparing different forms of chemical behaviour but has also become a visual metaphor and also serves as a metaphor for the presentation of knowledge in various domains (Lengler and Eppler 2007). It has become a subject of information visualisation in its own right, with variations suggested, including an eight-period table by Charles Janet in 1928 where he combined the

periodic table with Niels Bohr's system of electronic configuration (Katz 2001, 327). Mark R. Leach has comprehensively compiled a 'zoo of periodic tables' many of which are metaphorical as well as functional (Leach 2009).

The periodic table was included as an exhibition at the 1951 Festival of Britain display in the Exhibition of Science, held at South Kensington. Ronald Dickens designed a display consisting of a spiral version of the table, and displays that included additional models of atoms. Crystal patterns were also the subject of design experiments through the work of the Festival Pattern group who based their designs on the work of Dr Helen Megaw. The exhibition was didactic but it also aimed to make science feel friendly (Moffat 2000, 103). Science was portrayed as 'natural.' As Isabelle Moffat has suggested, this naturalness of scientific knowledge 'symbolised by the atom, the crystal, or chemical element…sought to foster a visceral familiarity…by immersing the spectator in the concretized shapes of these elements' (Moffat 2000, 105). This foreshadows the immersive and experiential nature of recent digital arts.

Current media arts practice

Within current art practice, there are new media artists who engage with the earth sciences as a source of inspiration, knowledge and data about the physical environment. Going beyond 'illustration', they also engage in a critical discourse about the outcomes of those scientific practices. Similarly those who engage instrumentally with the processes of visualisation, implicit in the production of scientific knowledge in the earth sciences, go beyond replication of process to create a genuine blurring of the boundaries between art and science. As noted by Barbara Maria Stafford this could mean 'imaging may even begin to formulate its own questions and confidently say something about its own ends' (Stafford 1996, 10). Material images can become central to an argument or ideological position.

Gyr and Koumoutsakos have written 'Art is used as a means to illustrate science, on the one hand, and science serves as an instrumentality in creating art, on the other.'(Gyr, Koumoutsakos, and Burr 2000, 65) A common approach in new media arts is to build on and from laboratory experimentation, using scientific visualisation and tools as the generator of ideas, or even using those tools to produce the artwork itself. Scientific visualisation is then conceptualised as an art form. This shift was integral to the project 'Geo/centr/e/i/city-The Earth as Center.' After visiting the Phivolcs' Geology and Geophysics Research Division, the curator of the project, Fatima Lasay noted:

Such laboratory experimentation allowing the visualisation and prediction of natural phenomena also serves to aid discovery and creativity, as well as the synthesis, representation and apprehension of invisible or inaccessible phenomena (Familara et al. 2002, 233).

Cultural sensibilities were also brought to this project in the form of metaphors and myths about earthquakes and volcanoes from the Philippine Islands. Lasay also explained that there could also be a shift when using digital technologies and the computer from technology-focused utility to cultural mediator. The scientific visualisation technologies were a catalyst but not the full story. Distributed technologies provided related opportunities for communication and display.

Embodiment and experience

One common theme is how we, as individuals or cultural groups, are placed within the scale of things. Art installations such as 'Place-Ruhr' in Dortmund Germany (2000) by Jeffrey Shaw (Shaw 2000), 'A Body of Water' (1999) by Paul Sermon and Andrea Zapp (Fuchs 1999), and 'Datamining Bodies in Ruhr' (2000-2001) by Victoria Vesna (Vesna 2000) have shown a range of interventions that extend our appreciation through the use of the cinematic, telepresence and interactivity in different ways. These works also draw from and contribute to a specific cultural context and place and are, in different ways, celebrations and critique of a mining past that is location specific; in this case the coal mining history of the Ruhr region in Germany. Although usually praised and used as examples of exemplar works for their attention to embodiment, these works provide a strong sense of attention to a sense of place and celebration of industrial heritage.

Victoria Vesna has also explored nanotechnology and the relationship of crystals to the molecular, with Jim Gimzewski in through 'ZERO@WAVEWFUNCTION: nano dreams and nightmares'. This digital projection installation used sound, sensors and architecture to give an interactive experience where there was the illusion of manipulation, by visitors' shadows, of C60 molecules. This was first shown at BEAP 2002 and has had subsequent iterations in different venues, alongside the development of the Nanomandala exhibit (Vesna and Gimzewski 2005).

Conclusion

Social and mediated communication

This paper has aimed to show specific synergies and connections between the sciences and the arts. For example, where there was a transition across 'disciplines' as the disciplines were developed to provide knowledge and understanding of the Earth. Some of these were smooth transitions and translations, based on similar aims and objectives, or dependent on the use of the same tools and techniques; others were intellectually charged experiments to cross, what at the time, were conceived of as separate 'cultures'.

Philip Rashleigh was working at a transition point between the visualisation of rocks based on direct observation or through chemical analysis. He was also considering the communication of the information on minerals through commissioning of illustrations for accurate illustration in his books. My next two historical examples, the critical writings of John Ruskin and the display of the periodic table at the Festival of Britain of 1951 were didactic as well as communicative. The more recent examples of art-science explorations by digital artists move more clearly into an investigation of process, both the process of visualisation and the processes of audiences engaging in the work itself. In some of these cases, as with the Ruhr examples mentioned above, there was a mixing of the exploration of digital technologies for creating environments with a critical reflection of mining heritage. These might be termed 'art-technology' explorations rather than 'art-science' investigations. There is additional expressive value within the work, where the work is reinforcing sense of place and location. Knowledge is being created through interpretation; the work is not just 'illustrating' data. Social context is all important.

Visualisation therefore needs to be understood as more about process and its place within the social realm. This highlights the complexity of the visual. Elizabeth Edwards and Kaushik Bhaumik suggest that there is no 'pure visual object as such but only uses of embodied and sensorially engaged sight' (Edwards and Bhaumik 2008, 11). Their description of the 'book' is relevant for other forms of mediated communication. They state:

The visual is used explicitly when one reads a novel, but also implicitly as the reader simultaneously feels his way through the world made up of entanglements – material, emotional, conceptual or sensual – described in the novel (Edwards and Bhaumik 2008, 11).

Besides a reading by the viewer of social context, the response of the viewer and audiences is also integral to visualisation. As the examples of art-science connections show there may be strong didactic intentions; but these were not just about 'objectivity' but were also about a sense of wonder and beauty about the Earth.

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