FLEISCHMANN / STRAUSS

The Archive of Digital Art, 12/2023
Text by Alejandro Quiñones Roa
Interview by Carla Zamora and Alejandro Quiñones Roa

Monika Fleischmann and Wolfgang Strauss, art collective and professors from Germany, are esteemed figures in the field of digital media art and interactive installations. Not only have they pioneered the development of much-discussed interactive and immersive works but they have also explored the research field of media art history, archiving, and open-source knowledge extraction interfaces. Almost in parallel to the initiation of the Archive of Digital Art (former Database of Virtual Art) in 1999, they introduced the online archive and research platform for digital culture "netzspannung.org" which has not been updated since 2010 but is archived and accessible on a server at the Center for Art and Media Karlsruhe (ZKM).
The duo's contributions have also had a significant impact on the development of virtual and mixed reality as well as on collaborative works that often involve the active engagement of viewers on multiple sensory levels; thus enabling exploration of new modes of perception and the interplay of body and space in the context of art and technology as a thinking space.

Wolfgang Strauss and Monika Fleischmann at the 2017 Edition F Women Inventors' Award (photo credits: Mark Feigman) https://www.fleischmann-strauss.de/Images Last accessed September 5, 2023.

Fleischmann / Strauss have individually and collectively founded a remarkable number of research labs in Germany such as the Media Art and ReSearch (MARS) - Exploratory Media Lab (1997) at the German National Research Center for Information Technology (GMD), and in 2005 the eCulture Factory at the Fraunhofer Research Institute for AI and Robotics. They are co-founders together with Edouard Bannwart and Wolfgang Krueger of the internationally renowned art production and installation studio ART+COM in Berlin; established in 1987 as a research institute and becoming a registered association in 1988.[1] Their work has been exhibited internationally in galleries, museums and art festivals. Fleischmann / Strauss have received numerous awards including the Golden Nica of Ars Electronica (1992) and the SIGGRAPH Lifetime Achievement Award in Digital Art (2018).[2]

A LIFETIME RESEARCH

Fleischmann / Strauss started working together in 1987 at the intersection of art, science and technology. Their artistic background was influenced by the Berlin feminist movement of the 1970s, the international architectural scene, and the emerging Berlin subculture. Reflecting on the developments and dynamics of computational and networked environments, from the first moment they investigated perception through technology. Their work encompasses dissimilar creative approaches to interactive technologies which enable audience performativity, especially multi-user and collective interaction. With a focus on interactivity beyond the act of interaction, they have proposed artistic methodologies that ensure a playing-field for improvisation and interpretation.

Enriched by poetic and smart narratives, Fleischmann / Strauss' work lays the foundation for a unique concept they call the "performative interface," with the purpose of reflecting on current issues ranging from recent European history to the emergent use of digital technologies.[3]

[1] Fleischmann, Monika and Strauß Wolfgang. ***„Media Art as Thinking Space"****- their website theme.* https://www.fleischmann-strauss.de Last accessed July 24, 2023.
[2] Proceedings SIGGRAPH '18. ***Lifetime Achievement Award in Digital Art*** https://dl.acm.org/doi/10.1145/3225151.3232526
[3] Fleischmann, Monika & Strauss, Wolfgang. (2023) ***„The Performative Interface: What you get is what you did Not see".*** Encyclopedia of new media art. Ed. Paul Thomas, Bloomsbury, London, to come.

Berlin–Cyber City

Berlin-Cyber City (1989)

In *Berlin–Cyber City* (1989), the artists created an interactive space for a larger audience. This interactive city simulation system was a result of the urban planning ideas competition for the redevelopment of Potsdamer Platz after the fall of the Berlin Wall.[4] In the work visitors gathered around an interactive table showing an aerial view of Berlin, with images of the city from 1970 and the middle of the Cold War.[5] By moving a sensor across the table users could view a projected 3D rendering of the city's former appearance. Thus users had the opportunity to revisit and pass through a series of 3D blocks, resembling the appearance of the city. During this virtual journey political borders were voided and users could bypass the city limits, including The Brandenburg Gate which was closed at that time. By allowing people to gather around the interactive table the installation *Berlin–Cyber City* provided a space for public discussion about common recent history, as well as participation and collective sharing of personal experiences about life-changing situations.

As Hanna Arendt exposed in her book *The Human Condition*, public space is mediated by in-between objects (in this case, the interactive table) that allow people to be connected and yet have dissimilar perspectives. According to Arendt the public space is created by the existence of the objects that simultaneously relate and separate men.[6] Following Arendt's ideas, the collective Fleischmann / Strauss created a metaphor for and experience of public space, allowing free virtual mobility across the city and the possibility of one-to-one conversation.

---

[4] ART+COM studios. Last accessed on July 17, 2023.
https://artcom.de/?project=berlin-cyber-city-2

[5] Fleischmann, Monika and Wolfgang Strauss. (2019) Fleischmann, Monika, and Wolfgang W. Strauss. "Shades of Virtuality: From Virtual Reality to Mixed Realities - From Being to Becoming." Published by RIXC Center for New Media Culture, Riga, 2019. ISBN-10 9934843471 [Link]

[6] Arendt, Hanna (1958) ***"The Human Condition"*** Penguin Books. Page 201.

Home of the Brain

Another renowned artwork by the collective Fleischmann / Strauss was the first artistic VR installation that involved networked computers, between Geneva and Berlin. In *Home of The Brain* (1989 – 91) the duo explored not only the new medium of VR but also presented a philosophical debate about human-machine interaction and the growing collective feeling of global interconnection through digital networks.

Home of the Brain (1989 - 91)

In *Home of the Brain*, by donning a data-glove and data-goggles a visitor in each location could virtually shake hands with the other and explore an immersive digital environment.[7] Other visitors could follow the navigator's virtual hand in the 3D scene on a projection screen while watching images and listening to audio quotes from prominent media theoreticians about the social implications of new media technology.[8] This immersive experience was intensified by the voices and their debates.[9] Luca Farulli, professor of aesthetics, highlights the importance of the voice in the artists' work:

> In *Home of the Brain*, the thinkers are represented, and yet absent. The viewer encounters voices and not physical people: voices which utter the message, the prophecy of the four philosophers concerning the future of digital culture. So here comes back the voice which enlivens a mental image, a phantasm, allowing the viewer to imagine the body which comes with that voice.[10]

The interactive tele-performance and installation depicted the dynamics of the ever-growing technological developments of the late 1980s – a breakthrough era for the mass use of personal

---

[7] Fleischmann, Monika and Wolfgang Strauss. ***"Home of the Brain (1990–92): A networked VR installation as virtual exhibition of philosophers' thoughts."*** In Virtual Creativity, Volume 9, Issue 1-2, Dec 2019, p. 111 - 115. DOI: https://doi.org/10.1386/vcr_00007_7

[8] Media Art Net. ***"Fleischmann, Monika; Strauss, Wolfgang „Home of The Brain""*** Last accessed July 31, 2023. http://www.medienkunstnetz.de/works/home-of-the-brain/

[9] Simmen, Jeannot (1999) ***Neue Medien, neue Welten: Digitale Kunst.*** In: Brockhaus, Kunst und Kultur, Band 6. Leipzig/Mannheim, p. 151.

[10] Farulli, Luca (2011) ***"Voices, gestures, contact."*** Published in: Performing Data: Monika Fleischmann & Wolfgang Strauss, ed. K. Miekus, Center for Contemporary Art, Gdansk 2011, Pages 37 – 46.

computers and mobile phones and ultimately the Internet.[11] By offering an interactive experience of being interconnected, the artwork was one of the early media art installations that pointed to the fluctuating contemporary reality by incorporating elements from the virtual and real world. Art historian Oliver Grau calls the *Home of the Brain:*

> "one of the earliest memory spaces that represented a completely new form of public space - that of global computer networks. […] A modern version of a *Stoa*, it offers a simulated, highly symbolic information space in which to engage in a metaphorical discourse about the ethical and social implications of new media technology."[12]

In his seminal work *Virtual Art: From Illusion to Immersion*, Grau identifies *Home of the Brain* as one of the works that marked a turning point in media art in the 1990s.[13] He sees it as a "mirror of media theory" that reflects key theoretical ideas of the time and as an example of how media art opens up new perspectives on human perception and the relationship between the body and technology.[14] In recognition of its innovative approach and the clear and precise relationship between its form and content, *Home of the Brain* was awarded the Golden Nica of Ars Electronica in December 1992. The installation not only worked as a digital immersive experience but also posed questions on digital representation and identity by quoting opposing positions of philosophers such as Joseph Weizenbaum, Marvin Minsky, Paul Virilio and Vilém Flusser.[15]

Liquid Views

Liquid Views (1992)

---

[11] Kluszczyński, Ryszard W. (2011) ***"Living between reality and virtuality. Remarks over the work of Monika Fleischmann and Wolfgang Strauss."*** Published in: Performing Data: Monika Fleischmann & Wolfgang Strauss, ed. K. Miekus, Center for Contemporary Art, Gdansk 2011, Pages 6 – 20.

[12] medienkunstnetz ***"Immersion and Interaction. From circular frescoes to interactive image spaces***". Last accessed October 02, 2023. http://www.medienkunstnetz.de/themes/overview_of_media_art/immersion/18/

[13] Grau, Oliver. (2003) ***"Virtual Art: From Illusion to Immersion".*** Massachusetts Institute of Technology, p. 217

[14] Grau, Oliver (2001) ***Virtuelle Kunst in Geschichte und Gegenwart.*** **Dissertation 1999.** Berlin: Reimer Verlag, p. 155

[15] Radiance VR "***Monika Fleischmann and Wolfgang Strauss Home of the Brain, 1989 – 1990".*** Last accessed August 2, 2023. *https://www.radiancevr.co/artists/monika-fleischmann-and-wolfgang-strauss/fleischmann-strauss-home-of-the-brain/*

Entering an interactive work is always a special moment, as the artists pointed out in their Venice Lecture at MAH Re:Source 2023.[16] In Liquid Views (1992) the connection between the physical and the virtual is made by touching the surface of a water mirror. By using a horizontal touchscreen, a built-in camera and a projector, the installation allowed viewers to see themselves reflected on a screen while observing their own image. The viewers could hear the sound of water and by touching their reflection in artificial water, visitors create ripples that transform their image into a shadowy second self, through a real-time morphing algorithm. In *Bodies in Code*, Mark B. N. Hansen notes that the image "dissipates, but far from ending engagement, it catalyzes a transition into another realm – the realm of the dissolved image." It is "a body whose embodiment is realized, and can only be realized, in conjunction with technics."[17]

This exploration of touch as a form of tactile seeing and hearing subconsciously immerses the viewer in an intimate situation where the physical and the virtual merge. However, this intimate situation is projected for an audience, anticipating the emergence of a selfie culture between immersion and surveillance. Inspired by the Greek myth of Narcissus falling in love with his reflection in water, *Liquid Views* works as a digital metaphor for this myth and addresses contemporary issues of self-observation, public presentation and privacy-eroding surveillance.[18] Steve Dixon, author of *Digital Performance* calls the idea of transforming mirrors "perfectly embodied" in *Liquid Views,* "one of the most influential interactive artworks of the early 1990s."[19]

Murmuring Fields

In *Murmuring Fields* (1997), the artists Fleischmann / Strauss created an instrument played with the body. By means of camera-tracking, the interactive installation allowed people to trigger the transformation of a dataset of sound files via their movement. Polyphony was created when several performers moved simultaneously, exploring their movements in individual spaces, and listening to the reactions.[20]

---

[16] Fleischmann, Monika and Strauss, Wolfgang. Media Narcissus from Ovid and Caravaggio to Liquid Views and today's Selfies. 14. September 2023

[17] Hansen, Mark B. N. (2006), ***Bodies in Code: Interfaces with Digital Media,*** p. 19

[18] MAH Re:Source, Virtual Showcase of "***Liquid Views, 1992. Monika Fleischmann and Wolfgang Strauss".*** Last accessed September 19, 2023. https://www.resource-media.art/fleischmann-strauss-liquid-views/

[19] Dixon, Steve (2007), ***Digital Performance,*** Cambridge: MIT Press, 2007, p. 245

[20] ***„Murmuring Fields"*** (COLLECTIVE) MONIKA FLEISCHMANN | WOLFGANG STRAUSS. Archive of Digital Art. Last accessed September 4, 2023. https://digitalartarchive.at/database/general/work/murmuring-fields.html

Murmuring Fields (1997-99)

The stage provided by the camera-tracking and the live projection of the images, together with the sound reaction in a common constructed environment, allowed the audience to carry out a reflexive and experimental process about their role in a participatory experience, as a parallel to the media-theory panorama of the time. The interaction not only created a performative space but also addressed contemporary issues through cutting-edge technologies such as body-tracking and the organization of virtual environments.

Murmuring Fields is the artists' model project to demonstrate the concept of *Mixed Reality: A space filled with data* that connects online and onsite. It allows a unified design for geometry, audiovisual rendering, and virtual sensing, implemented using the Virtual Reality Modeling Language (VRML). Fleischmann / Strauss explain their approach:

> **The metaphor used for the ›mixed reality‹ stage is that of a room furnished or filled with data. The ›room‹ stands for the physical interaction space but the furniture of data is virtual and stands for the digital information space inhabited by info-communication bodies, agents and avatars.[21]**

The goal is to create interface environments that support people - in shared and remote physical spaces - to communicate as they naturally hear, see, speak, gesture, touch, and move. The artists are creating a laboratory to explore the body's perception of space, behavior, and communication.[22]

---

[21] Strauss, Wolfgang; Fleischmann, Monika (1999*)* ***Staging the space of mixed reality - reconsidering the concept of a multi-user Environment***, Proceedings. of VRML 99-Fourth Symposium on the Virtual Reality Modeling Language, ACM, New York, pp. 93-98

[22] Hünnekens, Annette (2002) ***Expanded Museum - kulturelle Erinnerung und virtuelle Realitäten****.* Transcript Verlag, Bielefeld, p 145 https://www.degruyter.com/document/doi/10.1515/9783839400890/html

“Let us say that mixed reality appears from the moment that tools first delocalized and distributed human sensation, notably touch and vision," states media theorist Mark B. N. Hansen.[23] From an observational to an operational perspective, *Murmuring Fields* explores the transition from external to internal imagery. Hansen comments on the artist's work: "This transition renders their mixed reality works allegories of mixed reality as the minimal condition of phenomenalization.”[24]

ARCHIVING MATTERS

Regarding educational interactive tools that could be used both in artistic and scientific contexts, the collective Fleischmann / Strauss has innovated since the very beginnings of their career. Around the same time that Oliver Grau created the *Archive of Digital Art*, they pioneered the formation of *netzspannung.org* (2001), one of the first archival resources in the context of new digital and media art. Artists and scholars contributed detailed documentation, descriptions, essays, and technical guides to their works and participated in workshops and tele-lectures organized by Fleischmann / Strauss and their research team.

netzspannung.org (2001)

The importance of archiving digital media caught the artists’ attention, as this medium is constantly developing and technologies used can quickly become obsolete. Fleischmann / Strauss faced the problem of losing their own works, as the contemporary underlying databases and technology were

[23] Hansen, Mark B. N. (2006), ***Bodies in Code: Interfaces with Digital Media***. Routledge, New York, p 9, https://doi.org/10.4324/9780203942390
[24] Ibid. p 19

more difficult to maintain than such systems are today. The artworks *Berlin–Cyber City* and *Home of the Brain* were among the first large and outstanding projects forever lost after a server crash. Only some video and image material remained, which is still used for documentation. This catastrophe led to the idea of creating an online platform that would serve as both a repository for artworks and a webinar room in the form of a Media Lab on the Internet.

> Netzspannung.org is a platform for interactive media art and teaching with new media, developed by Prof. Monika Fleischmann and Wolfgang Strauss at the Fraunhofer Institute for Intelligent Analysis and Information Systems IAIS. Online since 2001, *netzspannung.org* is an instrument for research, reflection and communication of electronic culture. The platform offers more than 2,500 work descriptions, texts, images and videos for interdisciplinary education in art, design, music and computer science. The knowledge productions of netzspannung.org were part of the exhibitions "YOU_ser: The Century of the Consumer" and "YOU_ser 2.0: Celebration of the Consumer" at ZKM from 2007 to 2009. Since December 2010 it is hosted by ZKM.[25]

netzspannung.org preserves activities such as the *Digital Sparks* (2001-08) competition for universities; *Learning Media Art* (2002-04), a cookbook for media art education developed in cooperation with 22 German universities; and the streaming and archiving of *Tele-Lectures* (2001-04) by renowned artists and scientists with the help of the *Mobile Unit* (2000). At *netzspannung.org* for example, students, researchers, and teachers could access detailed information about the lectures and the artworks mentioned in them. The platform helped to expose information in new and unexpected ways, and to network artists and researchers internationally. Fleischmann / Strauss characterizes it as follows:

> ***"netzspannung.org* differs from monopolistic social network platforms (Facebook 2004, Youtube 2005) by its interoperable structure with the possibility of connecting archives. An example of this is the Hypermedia Tele-Lecture, which uses sources from different archives in the live lecture."**[26]

It all started with an e-mail survey to the international art community in 1998, which resonated and became part of the seminal *netzspannung.org* concept. The idea of a web-based and distributed archive was the most frequently mentioned concept, the artists noted; It was new technology and thus not easy to find partners with the necessary expertise and vision. Their vision of a digital archive was inspired by the words of AI pioneer Marvin Minsky: "Imagine a library where the books cannot talk to each other."[27] Following this idea, the *netzspannung.org* database was modelled by an artificial neural network and trained to create a self-organizing knowledge map. With each new entry, the image of the archive and the access to the knowledge map changed. It was no longer an interface for searching, but an interface for finding and discovering.

---

[25] ***netzspannung.org. Plattform für interaktive Medienkunst und Lehre mit neuen Medien / Platform for interactive media art and teaching with new media.*** https://zkm.de/de/projekt/netzspannungorg

[26] Fleischmann, Monika & Strauss, Wolfgang. (2023) ***„The Performative Interface: What you get is what you did Not see".*** Encyclopedia of new media art. Ed. Paul Thomas, Bloomsbury, London.

[27] Minsky, Marvin (1990) interview accompanying ***The Future of Fusion of Science, Art and Psychology*****.** Ars Electronica Symposium 1990: Natural Intelligence - Artificial thinking.

Fleischmann / Strauss argue that the classic retrieval model, which operates on the principle of "What you see is what you get," requires precise search queries. But when you're not sure what you're looking for, performative browsing interfaces become essential. The spatial *Semantic Map* (2001-04) and the time-based *Media Flow* (2006) exemplify the concept of "what you get is what you didn't see before". These interfaces facilitate Knowledge Discovery and are suitable for both screen-based and immersive installations.[28]

Semantic Map

In *netzpannung.org* the borders in between interactivity, playability, and scientific research were explored. The platform's innovative tool *The Semantic Map* (2001-04) provides a new method for cross-subject system in the ever-dynamic and interdisciplinary field of media art.[29] In an experimental format, *The Semantic Map* provided an information pool that help to visualize and analyze data in the digital archive. It was based on the principle of Self-Organizing Maps invented by Teuvo Kohonen in the 1990s, which uses semantic text analysis to discover content links between texts, to identify similarities, and to summarize them into thematic clusters.[30] It is a type of artificial neural network algorithm which is based on unsupervised learning in a data-driven way. With the invention and implementation of the *Semantic Map*, the artists created a knowledge discovery tool that helped to reflect on new media art, beyond the limits and formats of contemporary art.

As Fleischmann / Strauss explain: "The documents of the individual works appear as nodes in a network of thoughts, themes and practices that expands with each new database entry. The viewer discovers information through differentiation and thus becomes a co-producer of meaning. Therein lies the performative act of viewer and interface. Searching and finding, overview and detail are combined in the interface on one and the same level. It is an operational image that evokes movements of thought".[31]

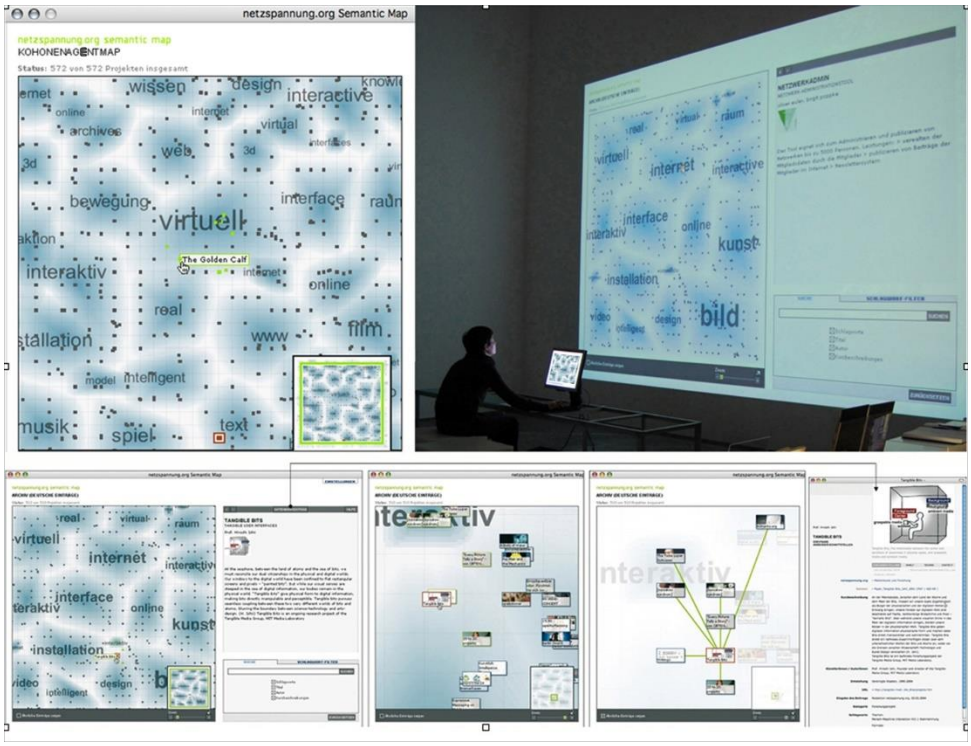
---

[28] Fleischmann, Monika & Wolfgang Strauss. (2023). ***New Media Arts - the Thinking Space for Digitality***, in Creating Digitality, ed. Anthony Brooks, Springer, London, to come

[29] Netzspannung.org, **"The Semantic Map"** (2005). Last accessed September 11, 2023. http://netzspannung.org/about/tools/semantic-map/index.xsp?lang=en

[30] ***„Semantic Map"*** (COLLECTIVE) MONIKA FLEISCHMANN | WOLFGANG STRAUSS. Archive of Digital Art. Last accessed September 11, 2023. https://digitalartarchive.at/database/general/work/semantic-map-a-radar-system-for-navigating-the-data-cosmos.html

[31] Fleischmann, Monika & Wolfgang Strauss. (2023). ***New Media Arts - the Thinking Space for Digitality***, in Creating Digitality, ed. Anthony Brooks, Springer, London, to come



Semantic Map (2001 -04)

Fleischmann / Strauss initiated a tradition in interactive art, establishing many methods that are nowadays common in many places in the world and offered a Thinking Space that could be accessible by anyone, highlighting the importance of public participation in works of art. The *Semantic Map* is an illustration of a networked data space. It marks a historic shift in digital archiving because it uses artificial intelligence techniques. Instead of relying on traditional selection lists, this approach presents the archive data as a dynamic data landscape that also serves to organize the structure of the archive. Astrophysicist Roger Malina, speaking at the ArtMedia VIII Paris 2002 conference, compared the interface to a "telescope with which to search and explore the data cosmos"."[32]

After ten years and without any further financial support, Fleischmann / Strauss decided to hand over their extensive collection of media art to the ZKM in 2010.[33] The archive itself is archived and hosted as a virtual machine on a ZKM server. The database is accessible with alternating early interfaces, by which online users can enter either the *Classic View* (2004)[34], or the *Randomizer* (2004), an intuitive tool that offers a random approach to the content; or they can select the *Archive Browser* (2004), a list with all the entries. Originally, the knowledge discovery interfaces *Semantic Map (2001-04)*, Digital Sparks Matrix (2005), and *Media Flow (2006)* were accessible online, but due to technological dependencies they are

[32] Malina, Roger. (2002). **ArtMedia 8**, Paris; quoted on ICHIM 03 – Economics / Problèmes Économiques, Archives & Museum Informatics Europe, 2003. https://www.archimuse.com/publishing/ichim03/018C.pdf, p. 8, (last accessed: 1 June 2023).

33 ***Medienkunstportal „netzspannung.org“ zieht um ans ZKM* / Media Art Portal "netzspannung.org" moves to ZKM.** Fraunhofer press release December 22, 2010. https://idw-online.de/en/news402889

[34] Netzspannung.org, **“Classic View”** (2012). Last accessed September 11, 2023. http://netzspannung.org/archive/classic/?lang=en

currently only available as browser-based stand-alone screens on-site, or walk-in installations at the ZKM in Karlsruhe, Germany. At the opening of the artists' exhibition "Interfacing the Archive" (2012) at ZKM, Peter Weibel stated:

> *Netzspannung.org and its groundbreaking interfaces create new structures for thinking and working with data. What has been achieved here is a model for an educational infrastructure that deserves international recognition and imitation.*[35]

All the graphical interfaces above mentioned, provide a similar experience to the early days of media art archiving, exemplifying the perspective of the researchers of the time. Even now, they are broadly recognized as a source of documentation for media art, media technology, and media science studies, and constitute a solid database for artists working in the fields of digitality and cultural heritage.

Energy Passages

Energy Passages (2004) is an installation in urban space that visualizes the news of the *Süddeutsche Zeitung*, a major German newspaper. It explores language in an interactive, participatory, and playful way. In the interactive installation, texts from the newspaper —sorted by semantic text analysis— were refined to keywords.[36] In *Energy Passages* the original meaning of the texts used in the newspaper was altered by a digital process which expanded the implications and social understanding of the news. The installation allowed the viewers to be involved in a co-created performance of indefinite duration, producing always evolving and unexpected narratives. By speaking to a microphone or by using a touchpad the audience could select words. Afterwards, people observed keywords related to the news projected on the public space, producing the effect of a human-machine conversation.

Energy Passages (2004)

[35] Weibel, Peter. Commentary on netzspannung.org. "***Inter-Facing the Archive. The Media Art Portal netzspannung.org***" Last accessed October, 01.2023 https://zkm.de/de/event/2012/06/inter-facing-the-archive

[36] Energy Passages website. ***„Energie_Passagen [Energy_Passages] – Reading and (De)Scribing the City"*** Last accessed August 22, 2023. http://energie-passagen.de/projekt_engl.html

Energy Passages made use of the nearest neighbors' principle, by which a term could be interchanged by its five semantically connected words in a classified system. Artificial voices would then recite the changed words, generating a soundscape of superimposed readings in which the audience was an active participant. This approach transformed the text into a non-linear, media-based urban reading experience. Over a period of four weeks, the decisions and actions of both the newspaper and the audience were tracked. People favored terms such as: price, parents, victims, love, food and girls; While the newspaper frequently used: percent, years, Germany, millions, people, and Munich. The installation conveys the atmosphere and aura of a place that allows the audience to participate, express themselves and exchange ideas.

> "A true evocative object, comments sociologist Sherry Turkle. The notion of a spatial experience of the discourse of the news within a city space and the possibility of deconstructing the newspaper captures the fragmentation of how media is experienced by citizens in a culture of simulation. It thus mirrors and concretizes an important cultural and political moment, turning it into an object for reflection."[37]

Curator and media theorist Christiane Paul discusses the connection between two areas of public life that are usually kept separate:

> While the inhabitants of a city naturally dwell in both of these spaces – the public domain of information and of the city – they usually do not have the possibility to experience these localities as connected networks or collaboratively reconfigure them. Energy Passages literally reinscribes the passages of energy that inform our daily life onto the street, allowing the passers-by to 'perform' the events of the day in their multiple semantic connections.

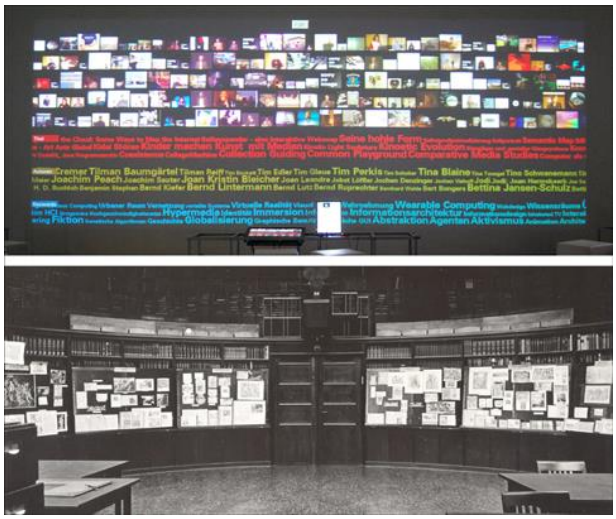
THINKING SPACE

One of the most relevant developments of the Fleischmann / Strauss collective was to reflect on contemporary issues related to the exponential growth in the use of media. The artists provided a stage for experimentation and reflection. By allowing the audience to co-author the theme and form of the artworks, they offered a platform for creative acting and thinking. In *Murmuring Fields* for example, the audience was invited to freely transform the live projected image and the atmospheric sound generated by camera-tracking. Here, the artists designed an interaction to provide a medium for collaborative thinking while acting. In this respect their approach to research resembled a scientific methodology, where experimentation and refinement culminate in a product that meets practical needs rather than relying solely on subjective artistic expression. This is the case of internationally renowned exponents of

---

[37] ***Energy-Passages* (2004) – *Words in a flow. Interactive installation in public space***. Monika Fleischmann & Wolfgang Strauss. http://www.eculturefactory.de/CMS/index.php?id=374

interactive and digital art, such as Charlotte Davies, Christa Sommerer and Laurent Mignonneau, Jeffry Shaw, Victoria Vesna or Monika Fleischmann and Wolfgang Strauss, as Oliver Grau stated in *Immersion and Interaction, from Circular Frescoes to Interactive Image Spaces*. These artists work as scientists in research laboratories. They develop new interfaces, interaction models and code innovations, setting anew the technical limits according to their aesthetic aims.[38]



Mediaflow (2006) and Aby Warburg's "Mnemosyne Atlas" (1925)

According to Oliver Grau, the collective Fleischmann / Strauss aims to implement media in a non-standard way, generating new outcomes and designing never-before-seen interactions by means of scientific research. The collective builds media interlinked architecture, by which people, data, and space can relate to each other. Their initiative is to offer a public space, in which people can connect in unexpected ways, broadening the limits of their interaction.

The thinking space offered by *Home of the Brain*, *Murmuring Fields,* and *Energy Passages* among other artworks, allows audiences to experience and experiment with interactive tools in non-standard ways. They allow people to interact and co-author the subject matter of the projects through the creative production and use of technology. Whether projecting text, playing voice recordings and/or selecting news from a local newspaper, the works permit users to delve into the complexities of media art theories through the use of media itself. In this way, the Fleischmann / Strauss installations constitute a remarkable research platform that could be used in artistic, social, and educational contexts.

The artists' notion of "Thinking Space" / "Denkraum" is a reference to Aby Warburg's *Mnemosyne Atlas*, which arranged documents in variable visual clusters. In the semantic map however, the documents form variable clusters based on content relationships generated by artificial intelligence. In "Atlas or

[38] Grau, Oliver (2004). ***„Immersion und Interaktion. Vom Rundfresko zum interaktiven Bildraum".*** In medienkunstnetz.de. Last accessed September 4, 2023. http://www.medienkunstnetz.de/themen/medienkunst_im_ueberblick/immersion/1/

Oracle", Art historian Daniel Becker compares Aby Warburg's concept of the archive with the *Media Flow* (2006) interface of the online database *netzspannung.org*.[39]

Fleischmann / Strauss describe the notion of a thinking space as an ethical necessity. They understand their practice of interactivity as a contemporary strategy to aesthetically intervene in the internationally operating media and media art industries and to create a third space between the poles of fusion, namely a thinking space. Thinking space for the artists here means creating a place for collaborative thinking as a medium for reconfiguring thinking. Fleischmann / Strauss emphasize the striking difference between the use of the goal-directed industrial interface and the performative interface. They point out that an industrial interface is essentially what you see is what you get. The artists' performative interface on the other hand, is a reversal of things, a revelation of what is hidden: What you get is what you did not see; They suggest: Being surprised by something made visible by one's own actions creates a new space for thinking.[40]

The artists emphasize that their projects are the result of dedicated efforts to get funded. Especially for artists, there is no guarantee of financial support when working in the shark tank of large IT research institutions. However, the creation of the MARS lab at the German National Research Center for Information Technology (GMD) and later at Fraunhofer Research has been a remarkable and outstanding success, both in terms of funding and results.

INTERVIEW WITH FLEISCHMANN / STRAUSS

A common theme throughout your career has been digital identity. Works such as "Home of the Brain" and "Liquid Views" raised questions about the way in which the use of digital networks transforms how we define ourselves. How important do you think the use of digital networks and devices is in terms of identity formation of the contemporary individual?

> "Who am I?" and "Where do I belong?" Having no identity, asking who you are is an important question for all people and especially for young people, transgender people or for migrants. A strong sense of identity can be an empowering tool for people to be agents of positive change in society. Identity today is shaped by digital interactivity challenging traditional human behavior. Digital networks provide platforms for self-expression, connecting people globally. We explored this incipient transformation from the late 1980s with works such as *Berlin-Cyber City* (1989), *Home of the Brain* (1989-91) and *Liquid Views* (1992). Questions about how we perceive in digital environments were just beginning to emerge.
> In a way, *Home of the Brain* (1989-91) was identity-forming. It allowed viewers to walk through other people's thoughts, as Derrick de Kerckhove has noted. They met four pioneers of digital culture and learned, for example, about Marvin Minsky's recommendation that children's brains be implanted with chips so that they could learn faster and spend less time acquiring knowledge. Wearing data goggles, visitors could experience media fantasies and prophecies by hitherto largely unknown thinkers as virtual reality.

---

[39] Becker, Daniel (2017). **Atlas or oracle?** https://zkm.de/en/magazine/2017/01/atlas-or-oracle

[40] Strauss, Wolfgang and Monika Fleischmann (2020). ***„The art of the thinking space—a space filled with data."*** Pages 156-170 | Published in: Digital Creativity. Volume 31, 2020 - Issue 3: Shifting Boundaries: Practices and Theories, Arts and Technologies. https://www.tandfonline.com/doi/full/10.1080/14626268.2020.1782945

Liquid Views (1992), on the other hand, shows how the media narcissist leaves traces on the web by lovingly looking at his or her face and tenderly stroking the surface of the screen. The viewer's intervention, which causes his or her image to dissolve in virtual water, is a metaphor for the traces we inevitably leave on the Internet.
Today, a digital identity is central to the individual who wants to have a public voice. It forms the basis for their presence, communication, and interaction on the Net. Those who have access to digital media have a voice and can express themselves globally. Digital identity enables people to be active in social media, online communities, and other digital spaces. Digital media has become a vehicle for personal expression with unprecedented reach. On the other hand, it gives everyone the opportunity to post whatever stupidity they want to the world. This is accompanied by a change in self-perception through community feedback and, among many other new problems, particularly the problem of constant surveillance by hostile people, through increasing data misuse and e-commerce.
The platforms, networks, and industrial machines that now store and process these digital identities to determine our thoughts and desires are not neutral. What seems free and easy to use for the many makes a lot of money for the few. Media artists began to discuss these issues early on. Data trafficking is the modern form of human trafficking. From a high-speed economy to a frenetic standstill, platforms and networks lead to a complete upheaval of society.

Since the early days, you have implemented contemporary technology to address present-day issues. To what extent does the use of current technologies itself determine the topics you are choosing and vice versa?

In 1987, together with Edouard Bannwart, we founded the first research institute for art and new media in Germany, ART+COM in Berlin. The starting point was, that we did not want to leave our future to computer science or information technology alone. Technical developments should always be accompanied by cultural issues. This has been our concern. In our work, technology and critical issues evolve together. Current issues often inspire us to explore them with current technology. In turn, technology influences how we approach these problems.
In our dedicated research labs, we have always asked ourselves current questions through research projects that have been funded over many years. For example, at ART+COM, *The Electronic Model House,* and the specific issues of *Light and Acoustics in Digital Space* when we designed the real building for the Hewlett Packard headquarters in Berlin (1988-91). At the same time, we worked on *Berlin-Cyber City* (1989), an interactive table for collaborative discussions, and *Home of the Brain* (1989-91), which illuminated the think tanks of selected philosophers. All three projects were connected by our way of thinking and by the people who were part of our team at ART+COM. The ethical and cultural issues that we discussed had an impact on the aesthetic development of the technology and vice versa.

Starting from the late 1980s, you have had the opportunity to see the not so gradual change on the consumption of always faster and easier to acquire personal computers and mobile phones. How have you perceived these changes in your personal life and how have they impacted your art creation?

Our art, our lives, and our world have been transformed by the rapid evolution of personal technology. The way we think about art, science, and technology in the context of society has been profoundly affected by the ubiquity of personal computers and digital tools.
Our approach of working in interdisciplinary teams at research institutes, as well as our long-term artistic research projects and individual works such as *Berlin-Cyber City*, *netzspannung.org*,

Energy-Passages, have allowed us to create interactive experiences that challenge audiences deeply, perhaps unconsciously or retrospectively. This is not an accidental development in the research environments we have repeatedly created. Rather, it has been a daily struggle and confrontation with the way digital culture affects our lives.

In which sense do you think it is easier today to create unique interactive experiences than it was in the beginning of your career?

Today, the technological tools are much more accessible. Artists can focus on the creative aspects rather than the technical issues, as advanced software and hardware simplify complex tasks. On the other hand, there is always a need to experiment with new tools, such as AI tools, that are now available to everyone, for better or worse. At best, they are helpful tools; at worst, they waste a lot of energy or even destroy the minds of people' who must sift through thousands of pages of violence to train the AI. Finally, such tools prevent "users" from thinking for themselves. Another problem with AI tools is that we will get masses of images or text that no one wants to look at or read. The history of media art is already forgotten because it was and is not visible enough, but with AI it could end up ending art as we know it.

In *"Energy Passages"* for example, texts taken from daily newspapers were projected onto urban public spaces. The installation reflected on the multiple ways in which meaning is given to words according to contexts. Can you tell us about the creative process behind the installation and how your interest in the relation between language and interactive technology came about?

Energy Passages (2004) grew out of our fascination with language and context while working on the *netzspannung.*org archive and developing knowledge discovery tools such as the *Semantic Map*, the *Matrix*, and the *Media Flow*. The *Energy Passages* installation projected newspaper texts onto public spaces, exploring the multiple meanings that words take on depending on their surroundings - their next neighbors. Our interest in the fluidity of language led us to combine it with interactive technology. We invite viewers to reflect on the connections between words and environments, helping them to understand the difference between public and private voices, and how these voices influence us.

All your works are characterized by the well-defined design of detailed interactions, that allow the users to think creatively and autonomously, and to live a non-quotidian experience. How does the process of designing an interaction vary according to the artwork?

The process of designing interactivity depends on the intended experience, the narrative we want to convey, and the specific technologies we use. The interactive work is a non-linear narrative of tiny particles that interact to weave a digital fabric that can be reassembled into coherent pieces, as in *Energy Passages*, inspired by Wittgenstein's concept of the language game. But also, Flusser's definition of "passage" as a journey in which one walks or passes through individual elements as fragments of a larger context to condense individual impressions as parts of a whole into a tangible picture. This is one of our basic design patterns, just as another is derived from the ripples of water.
"Thinking is like a House" (Denken ist wie ein Haus) is the idea of describing the process of our thinking and the design process. Wolfgang Strauss (artist and architect) coined this phrase in a

lecture to students at the Saarbrücken Academy of Fine Arts in 1995. Like building a house, thinking is a process of putting together different elements and ideas to create a structured result. For us as artists and architects, this analogy offers an interesting perspective on the process of thinking in the context of building "Thinking Space". Of course, thinking is a uniquely human cognitive activity, often influenced by emotions, memories, experiences, and cultural factors; it is a much more abstract and complex process than building. What may be comparable, however, is that both require creativity, reasoning, problem solving, and contemplation.

Connected to the previous question - how relevant is the user's agency during the interaction designing process? Do you consider your installations to be co-created with the audience?

Regarding the question of the audience: Our concept of the Data Performer as the interactor of a creative encounter between real and virtual environments is a shared reality of human and machine. In all our concepts the audience and the individual interactor are part of the installation, and they have many ways to explore the work, but we are the directors of the ceremony and the whole process of creation. "Thinking is like a House" means that we have built the house, but the art is in a very flexible use by the visitors.
In contrast to pure functionality and instead of "what you get is what you see", our concept of the "Performative Interface", surprises the visitor (we try to avoid the computer term "user") with the motto "what you get is what you did not see", by combining hidden, previously unnoticed elements. This can be seen in our knowledge discovery tools such as the *Semantic Map*, or in the art installations such as *Murmuring Fields* or *Energy Passages*. These are tools and installations that generate new knowledge through interactivity. Not by searching, but by finding.

In the video interview you told us that after losing the data from previous artworks, you decided to invest some time in thinking how to archive media art. That is how the groundbreaking idea of "netzspannung.org" was born - a digital art repository that soon became an academic platform, with resources that to this day are consulted in various parts of the world. How has your academic life developed in relation to your artistic career? And how do they influence each other?

Our scientific and artistic careers are intertwined. As careers, both could have been more successful and therefore more effective if we had spent some time in the United States or Japan or Korea, where this kind of research between art and science is more highly valued.
In fact, our artistic endeavors have enriched our academic insights. Our exploration of the theoretical aspects of media art has informed our practice. Platforms like *Netzspannung.org* and texts about our work in art, science, and technology, which will hopefully soon become a book of our findings, have emerged from this symbiotic relationship. And all of this could only happen within our self-established transdisciplinary research teams in research environments. Working artistically in a scientific computing environment and collaborating with different disciplines is not an easy task. It wasn't a playground. We had to be successful in funding our research by getting huge research grants. On top of that, the administration of our research center was expensive. So, it was also expensive in terms of our limited lives. Would we do it again? Only with independent funding and intellectual commitment from the people around us, possibly in another country. Where that would be is a question.

In “netzspannung.org”, you designed a platform that not only allowed the visitors to gather information about media artworks, but to use tools to compare, analyze and reflect on their meanings, contexts, and connotations. When developing the tools, what aspects were relevant and how did you define the structure of the site?

> The development of *Netzspannung.org* (1987-91), launched at the *CAST01* conference at Birlinghoven Castle, was based on an understanding of the needs of artists, visitors, curators, and educators to learn about and engage with media art. We invited the global community to collaborate with us and tell us what they needed or wanted to collaborate on. We were interested in community building. We asked them to share their work on the platform. Through our many partnerships, we saw the platform grow with the work of great artists, with conversations and tools for exploration. At a time when there were no media art courses and often no computers in art schools, we worked with 22 universities on a research project about learning about media art in schools and universities. We focused on enabling comparison, analysis, and reflection on meaning and context through our knowledge discovery tools and many programs and events. The structure of the site grew out of a desire to provide accessible, comprehensive resources and learning tools, as well as best practices and *Digital Sparks* student awards from emerging art school programs, where educators could learn from each other. Artists, curators and scholars, students, and professionals, all found it helpful.

What are you currently working on?

> Our current projects include lectures and reflections about our work as the basis for a book. We document our work for archives such as the ZKM Archive or the ADA. After reconstructing our work *Liquid Views* (1992) with the help of the ZKM, we are now beginning to reconstruct our virtual reality installation *Home of the Brain* (1989-91), which won the Golden Nica Award in 1992. This work will integrate a language model for philosophical discussions with a language-based AI that explores the dialogic encounters of the four philosopher houses. It should make possible today what was conceptually conceived 35 years ago.
>
> What we have always done in parallel are projects that are not screen-based. In our first VR research project, the Electronic Show House, we involved employees in the design process for the Pool Office (1987-91). This was Hewlett Packard's first headquarters in Berlin. Employees described it as revolutionary, colorful, vibrant, and inspiring. Unlike all the identical open-plan offices of large technology companies around the world, it was designed for a different way of working.
> We are always interested in themed houses with philosophical furniture, such as "The Endless Column," a bookshelf we designed for our library inspired by Constantin Brâncuși, or "The Marble Cliffs," after Ernst Jünger, a staircase that turns a window into a balcony and contains a desk or "The Table of Silence" reflecting the sky. These apartment therapies are literally walk-in thinking spaces and a materialized representation of our virtual thinking spaces.

The Archive of Digital Art warmly thanks Monika Fleischmann and Wolfgang Strauss for their contribution to the world of media art, for their outstanding artistic and scholarly research, for documenting their work, and for their disposition to be interviewed.