The New Dunites

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ABSTRACT

The New Dunites is an interdisciplinary media arts research project that investigates the archeological site where the set for Cecile B. DeMille's *The Ten Commandments* was buried in 1923 [1]. In particular, this multi-phase endeavor involved the gathering of geophysical and archeological data, the historical study of the dawn of cinema in California, and a series of novel interactive multimedia installations that explored new avenues in the representation of scientific and cultural data.

Categories and Subject Descriptors

J.5 [Arts and Humanities]: Fine Arts

Keywords

Media Archaeology, Media Arts, New Media, Cinema History, Geophysics, Archaeology, Data Visualization.

1. INTRODUCTION

Buried beneath the sands lie the remains of one of early Hollywood's most extravagant silent film spectacles. In *The Ten Commandments* (1923), director Cecil B. Demille transformed the coastal dunes into desert, building atop them a stylized Egyptian palace of immense proportions [2]. The set from this epic production remains there today, the only artifact of its kind in the world. In this project we investigated and reconstructed some of the many histories of this complex place, using an array of tools and methodologies drawing from geophysics, archaeology, cinema, history, computational media and art practice.

Figure 1: The remains of the set from Cecil B. Demille's The Ten Commandments (1923).

2. EXPERIMENTAL MEDIA ARCHAEOLOGY [3]

Our primary goal in the field was to acquire information about what lay below the surface of the dunes. Due to the sensitive nature of the site, excavating was not possible – instead, we used two pieces of noninvasive technology: Ground Penetrating Radar (GPR)[4], and aerial photography.

2.1 Ground Penetrating Radar Survey

GPR provides a 3-dimensional data set telling the story beneath the surface. It works by sending pulses of electromagnetic energy into the Earth, and then detecting reflections of those pulses due to subsurface structures [9]. By sequentially tracing a precise grid on the surface of the dunes using the GPR machine, we conducted a GPR survey of an area roughly 60 meters by 35 meters in size, acquiring data on what was buried there to a depth of approximately ten feet.

2.2 Aerial Photography Survey

The design for our balloon was a product of researching some groups performing DIY aerial photography. In order to obtain a multispectral dataset of the site as viewed from the air, we acquired near-infrared images of the site using a modified digital camera. Image panoramas were then stitched together using one of many such open-source tools. The simple, cheap, readily-available, and often repurposed tools and techniques we used for the aerial survey reflect our general approach to media archaeology.

3. RESULTS: AN ECOLOGY OF INTERFACES

We seek an articulation of the complimentary nature of cultural and ecological narratives through a physical and digital experience.

3.1 Interface 1: Software for Navigable GPR Datasets

Our first interface is a custom software tool showing a real-time computer graphic visualization of our ground penetrating radar results. Users can navigate around a virtual reconstruction of the subsurface features, and can select the specific radar data

presented to them. Moving a horizontal plane shows features of interest by depth in the smaller window in the top left.
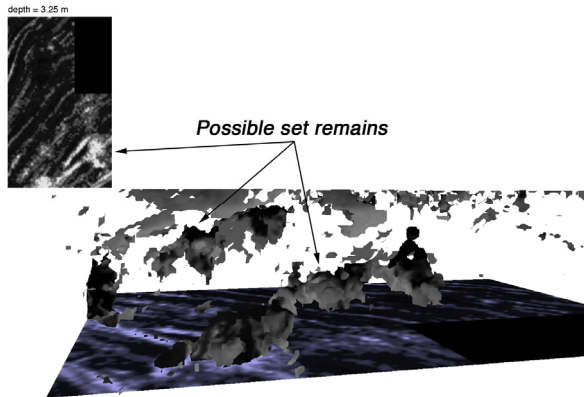

Figure 2. Custom real-time visualization software for navigation and inspection of GPR data [4]. Shown is a section of the subsurface of the Ten Commandments set remains to a depth of approximately 10 feet.

3.2 Interface 2: Reconstruction of Temporal Isosurfaces from Video Sequences

Ground Penetrating Radar [5] works by arranging successive slices of electromagnetic information into a volumetric data set. Inspired by this concept, we designed the second interface in our installation, which applies the logic of the context-free nature of digital data to the *Ten Commandments* film itself.

Temporal isosurface reconstruction generates a three-dimensional solid representing a video sequence. Successive frames of the sequence are arranged behind one another in space, and from this volumetric dataset an isosurface is formed which joins all areas of similar color into connected shapes. This representation halts the cinema's requisite passage of time, and instead recasts an ephemeral moment of narrative into a navigable, timeless environment. We designed a custom software tool which reconstructs temporal isosurfaces and allows users to navigate and explore them in real-time. In addition to the isosurface, a window in the upper left corner shows the user the position of a moving "slice" through the film. Of particular interest is the way that temporal reconstruction generates apparent solids from transitory features.
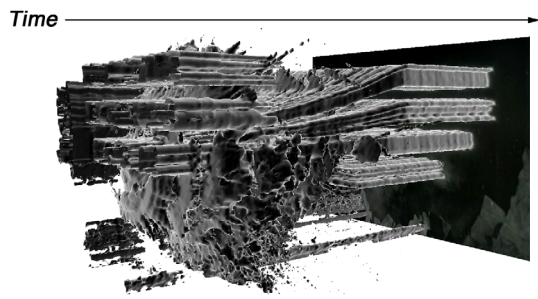

Figure 3. A ten-second sequence from the Ten Commandments film is temporally reconstructed. The frames in the sequence are layered behind one another, forming a three-dimensional shape.

3.3 Interface 4: Physical Datasets

This interface consists of built objects: two laser-cut acrylic sculptures created by spatially sequencing "slices" of data. One object visualizes a portion of our ground penetrating radar data, demonstrating subsurface features and dune formations, while the other object is made up of successive single frames from a ten-second sequence of the original film. Both forms echo their digital representations from the other interfaces.

3.4 Interface 5: GPR Data Visualization App for iPad

Our final interface is an application for the iPad tablet. Using multitouch gestures and the tablet's built-in gyroscope, users can view the ground penetrating radar data as a virtual volume. Users are encouraged to inspect subsurface features from any location and at any angle. The visualizations represent the data as a volume texture in an abstract form reminiscent of the films of Dunite Elwood Decker. Images generated by the user's explorations are projected within the installation space for other visitors to view.

4. EPILOGUE: THE RIDDLE OF THE SPHINX

The future of the dunes, and of the ruins beneath them, is uncertain. As the dunes continue to migrate inland, they expose layers of the past and splinter them into memory. Archeologists disagree [6] over the value of the information buried here: it's a site that comes to us not only from the era of written history, but from the age of the recorded moving image. Through experiments in media archaeology using the noninvasive potential of modern technology, and by presenting experimental ways to experience our multidimensional past, we hope to encourage the preservation and appreciation of this unique place, and others like it.

5. ACKNOWLEDGMENTS

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