

Through the Aleph: A Glimpse of the World in Real Time

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Abstract

This paper presents the motivation, background, and implementation of [Through the Aleph: A Glimpse of the World in Real Time](#), a net art project offering an unprecedented visual and interactive experience where many places on Earth and in space can be seen simultaneously in an instant. Built in an open source environment with live data, this project visualizes the diversity of human civilizations (microcosm) and the unity of humanity without borders in the ever-changing universe (macrocosm). With an unexpected approach to surveillance cameras and global networks it draws the connections between individuals and the global environment, Earth and outer space, eternity and time, and art and science. In a virtual world, this meditative web project merges multiple layers of dynamic imagery related to culture, cosmology, and technology in a globalized society into an abstract landscape. It not only embraces the dream of peace on Earth but also explores the bond between humankind and nature through time and space in the present moment.

Keywords

net art, web, real time, data, open source, media, interactive, webcam, surveillance, environment, multi-cultures, humanity, microcosm, macrocosm, literature, Aleph, Borges, space, time, coexistence, unity, peace, landscape, global, climate, networks, science, technology

Introduction

What Is an Aleph?

The letter Aleph is the first letter of the Hebrew alphabet, which symbolizes oneness and unity. Every letter in the Hebrew alphabet also has a numerical value, so the numerical value assigned to Aleph is one. On the other hand, the root of the word Aleph is also connected to many other words in the Hebrew language. The word *eleph* means a thousand; the word *aluf*, which also comes from the same root, means a (military) general or a champion. Thus, despite the fact that the letter Aleph only has a small numerical value of one, it also has connotations of greatness. (Hebrew Today, 2018)

In his short story *The Aleph*, Argentine author Jorge Luis Borges described that “an Aleph is one of the points in space that contains all other points” (Borges, 1970, p. 23)—the single gigantic instant where millions of acts in the unimaginable universe can be seen simultaneously

from every point and angle. He later explained in the story that “for the Kabbalah, that letter stands for the *En Soph*, the pure and boundless godhead; it is also said that it takes the shape of a man pointing to both heaven and earth, in order to show that the lower world is the map and mirror of the higher; for Cantor’s *Mengenlehre*, it is the symbol of transfinite numbers, of which any part is as great as the whole” (Borges, 1970, p. 29).

Rationale and Objective

As an avid traveler, the artist followed her curiosity to explore and study many places in the world. She has experienced diverse cultures and the beauty of nature, but also observed the lost wilderness, cultural globalization, and the growth of human population, while global tourism and global warming continuously increase.

Meanwhile, recent creative and research works by artists, such as [Kurt Caviezel](#), [Nye Thompson](#), and [Pierre Derks](#), on live surveillance cameras and global networks (and how these emerging technologies affect people’s privacy) have caught the artist’s attention. Inspired by the life changing power of seeing Earth from space, she started to wonder: Where were the eyes of the Earth? How could we see the world in real time at a glance? How could she offer a different perspective on life using surveillance cameras? From then on the seed of this project was planted.

Borges’ inspiring short story *The Aleph* influenced the artist to broaden the concept of this artwork. After 70 years, Borges’ vision in the 1940s can be realized in this networked age—to visualize millions of acts from every point and angle in the unimaginable universe in a single gigantic instant. Through his perspective, we experience the totality and unity of humanity in the infinite space, which hopefully could hint at the brevity and fragility in life and raise questions about the reality of human existence. Although a real Aleph might never be found, the artist hopes that by observing humanity, Earth, and space from a distance this net art could stimulate deeper feelings and thoughts from the viewers.

“The trees of knowledge and of life grow together” (Lewis, 2010, p. 18). Although this project serves no practical and material end, it is an end in itself. It offers no purpose other than the joy of contemplation, the need of human consciousness, and the desire of knowledge. At the core of the creative process, the artist’s gratitude towards life brought the projects alive using a universal language—visual art—and digital technology. Meanwhile, it evokes

certain emotions and sub-consciousness—a psychological phenomenon that involves a sense of life. In *The Aleph*, Borges mentioned a feeling of “infinite wonder, infinite pity” (Borges, 1970, p. 28). This is one of the sensations that the artist wants the viewers to experience through her work. Perhaps with humbleness and egolessness we stand closer to the greatness and wonders in Life.

Through the Aleph: A Glimpse of the World in Real Time visualizes a pair of opposites through the global reach of technology—the diversity of human civilizations (microcosm) and the unity of humanity without borders in the ever-changing universe (macrocosm). Although in recent times some creative and research works have used IP camera live streams and their linkage to the social environment also with the political scope to highlight the implications of this technological Panopticon, the artwork here presented utilizes surveillance cameras and global networks from a grand viewpoint to observe people, environment, and space within a philosophical and literary framework. It not only embraces the dream of peace on Earth but also explores the bond between humankind and nature through time and space in the present moment. Using live data to portray the Earth’s pulse and human existence, this meditative web art creates an abstract landscape in an open source environment, reveals an emerging totality visible to the human eye through distant points of perceptions, and gathers all realities into the glimpse of the Aleph, where we could experience humanity as one in the unimaginable space—therefore, the unity in infinity (Figure 1).

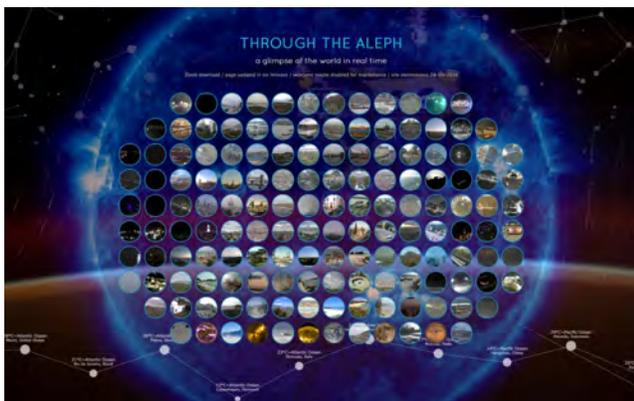


Figure 1. [A screenshot of *Through the Aleph*](https://vimeo.com/189509112). © Jing Zhou.

Making of the Project

Through the Aleph unites two entities—a net art and a time-lapse video. The net art was built with HTML, CSS, jQuery, JavaScript, and Processing, while the time-lapse video with Adobe After Effects. The webpage refreshes every six minutes automatically.

Edward Tufte, a pioneer in information design and data visualization, stated that “among the most powerful devic-

es for reducing noise and enriching the content of displays is the technique of layering and separation, visually stratifying various aspects of the data” (Tufte, 1990, p. 53). Retrieving and collecting real-time data from multiple online sources, *Through the Aleph* interlaces live materials into three layers based on the “freshness” of the visual elements—the bottom layer holds static and dynamic graphics from the recent past; the middle layer displays near real-time data; the top layer generates real-time content.

In her well-known article *Grids*, art theorist and critic Rosalind Krauss pointed out that “logically speaking, the grid extends, in all directions, to infinity... by virtue of the grid, the given work of art is presented as a mere fragment, a tiny piece arbitrarily cropped from an infinitely larger fabric” (Krauss, 1979, p. 60). In *The Aleph*, Borges’ literary conception of infinity poses a representational challenge as the artwork *Through the Aleph* is limited by a finite range of visual elements via webcam feeds and data visualizations etc. Hence, the artist created a grid mapping system to be the primary focus of this project, where Borges’ boundless imagination could be reflected and presented using limited graphics and data.

The Bottom Layer

This background layer (Layer 1 in Figure 2) empowered by HTML and CSS covers the entire browser window with a three-minute looping video, which captures the views of our planet Earth from NASA International Space Station (ISS) from 2011 to 2015. In order to keep the background atmosphere dark enough, the artist composed this video based on twelve nighttime ISS footages from [NASA’s websites](#). These royalty-free footages include seven continents except Antarctica, because the artist didn’t find footages of Antarctica during the time of making this project.

Within the top 30% of the webpage displays a transparent constellation map fading into the dark ISS video background. There are total twelve constellation maps stored online for this net art. All maps were captured based on the artist’s home location—the New York metropolitan area—through the website of the Astronomy Club of the School of Physics and Astronomy and [the Wise Observatory of Tel Aviv University in Israel](#). The original captured maps were colorful, complicated, and full of information unnecessary for this project. Thereby the artist simplified the maps and transformed them into a clean mono-color style. The twelve maps are synchronized with the twelve months of a solar calendar. Supported by JavaScript, the corresponding map is loaded automatically at the same location on the first day of the month.

Lastly, this layer holds a one-minute looping audio file invisible on the webpage, which produces the background sound—a white noise on low volume.

The Middle Layer

This second layer in the middle stores two visual elements enriched by near real-time data.

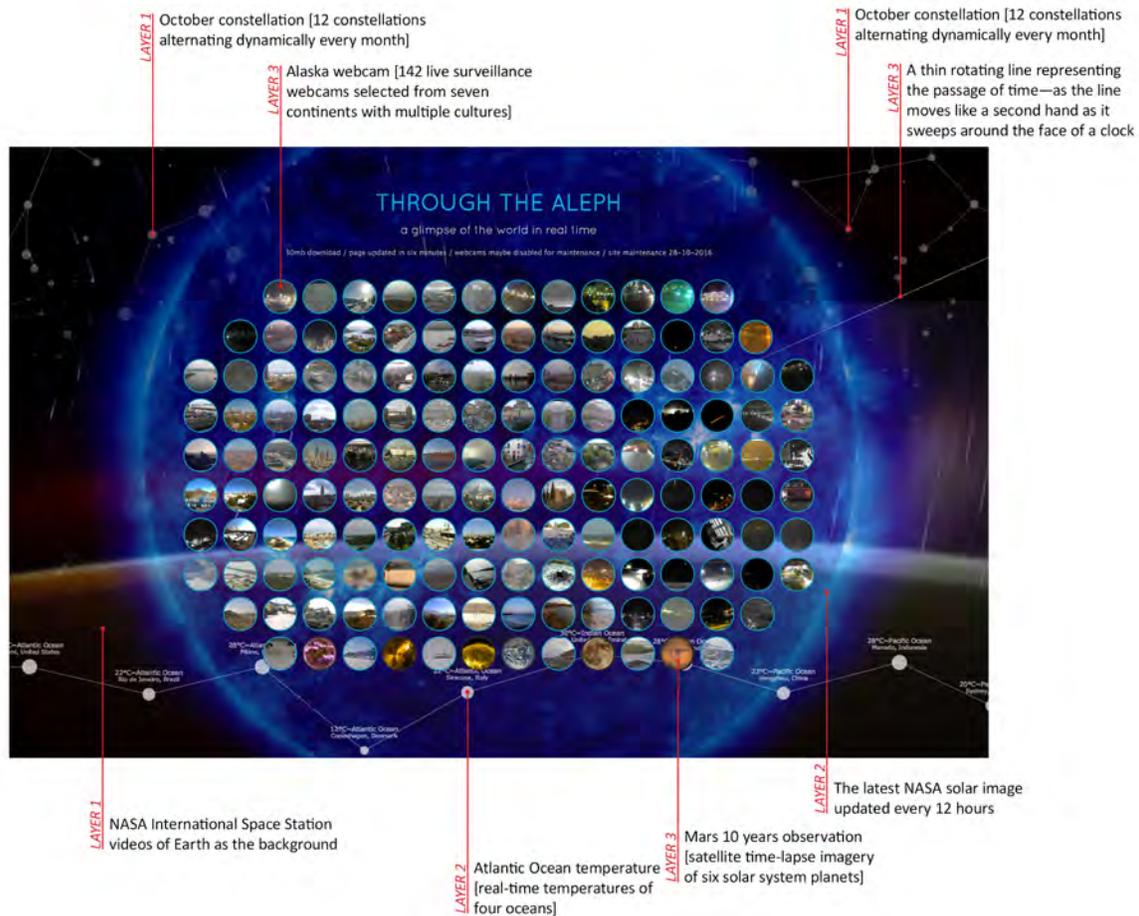


Figure 2. Diagram of *Through the Aleph*. © Jing Zhou.

At the center of the webpage resides a gigantic transparent blue sphere, shown in Figure 2. This is the latest solar image updated every 12 hours, provided by SOHO—Solar and Heliospheric Observatory, a project of international collaboration between European Space Agency (ESA) and National Aeronautics and Space Administration (NASA). This ever-changing image is retrieved dynamically twice a day from the [SOHO website](#) using HTML and CSS.

This royalty-free image is captured by SOHO's Extreme ultraviolet Imaging Telescope (EIT). All of the EIT images are actually produced by extreme ultraviolet (EUV) light from the Sun. EIT images are taken at four different wavelengths and four colors in order of wavelength (bluer—shorter wavelength, redder—longer) were assigned to represent each of them. (SOHO, 2018) The artist decided to use the bluest solar image in this project for three reasons. First, the Sun provides the primary source of energy to support life on Earth. Secondly, the deep blue color resembles the color of our planet Earth. Lastly, this very color matches well with the ISS video background, which enhances the aesthetic quality of the artwork.

Located at the lower portion of the webpage, the second visual element on this layer is a set of white dots. They represent the near real-time water temperatures of four oceans—Arctic, Atlantic, Indian, and Pacific Oceans—which play a crucial role in shaping the global climate change. Built with Processing, these dots linked by a thin

white line are in gentle motion, which forms a wave line representing the ocean water. The diameters and vertical locations of the dots alter perpetually depending upon the water temperature data, which updates dynamically every few hours supported by [the website of World Sea Temperatures](#). The artist selected twelve cities for the dots based on their latitude distributions and personal preference: Honolulu, United States; Miami, United States; Rio de Janeiro, Brazil; Pikine, Senegal; Copenhagen, Denmark; Siracusa, Italy; Dubai, United Arab Emirates; Mumbai, India; Hangzhou, China; Manado, Indonesia; Sydney, Australia; and Pevek, Russia.

The Top Layer

Layer three on the top hosts two overlapping entities generating real-time content.

Originating from the center of the web browser, a boundless thin white line rotates like a second hand as it sweeps around the face of a clock, shown in Figure 2. Programmed in HTML and CSS, this line represents the passage of time; every 360-degree rotation indicates that one second has slipped away.

Embraced by the deep blue circle, at the center of the page lies the heart of this net art. Built with HTML, CSS, and jQuery, a carefully calculated grid mapping system is populated by 148 circular graphics. Among them are 142

live surveillance webcams selected from seven continents with multiple cultures and six satellite time-lapse imagery of the solar system planets. This grid system distributes the 142 webcam feeds—supported by [OPAG Online Promotion AG](#)—in accordance with the world map, shown in Figure 3. However, because the northern hemisphere has more countries and larger population than the southern half of the Earth, the northern hemisphere occupies seven of the ten rows, while the southern three.

When the viewer uses a computer mouse to hover over one of the circular webcam images, it enlarges gracefully to reveal a bigger size of the same image with a brief description of the webcam's location; when it is clicked, a popup box appears in the center of the same browser window and showcases the source website of that webcam. (Figure 4) This body of surveillance webcams needs frequent maintenances, because any webcam could be disabled unexpectedly due to various reasons at anytime.

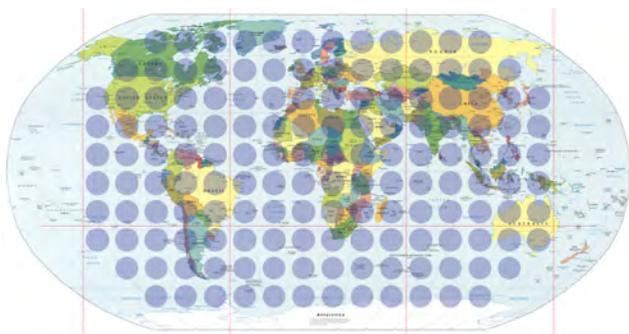


Figure 3. [Webcams' Geographic Distribution](#). © Jing Zhou.



Figure 4. [Two screenshots](#) demonstrating the interactivity of *Through the Aleph*. © Jing Zhou.

The Time-Lapse Video

The video component of this project consists of twelve-day time-lapse screenshots of the net art in twelve months—one day per month—from September 2016 to August 2017. It captures not only the shift of day and night, but also the change of seasons—the infinite and transitory nature of life on Earth.

Installation

Through the Aleph can be presented on monitors and projection screens. (Figure 5) The background sound of the installation is white noise, which can be silenced during an exhibition, if necessary.



Figure 5. [Installation shots](#) of *Through the Aleph*. © Jing Zhou.

Conclusion

The net art project presented in this chapter connects the potential of digital technologies with literature, culture, and scientific studies, in order to create aesthetic and meaningful experiences for the viewers of various backgrounds. *Through the Aleph: A Glimpse of the World in Real Time* visualizes Borges' Aleph in the networked age and touches the core components that matter today: building an environment for consideration of data in cultural and temporal realms, presenting a visual framework in a literary context, and packing universal visual components and conceptual thinking into a limited presentation space. Furthermore, it translates the dynamic virtual landscape through new approaches to enhance human cognitions and perceptions of the universe and humanity of our time.

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Author Biography

Born in China, Jing Zhou is an interdisciplinary artist, designer, and professor in USA. Her work has been shown and collected internationally including: Triennale Design Museum, Milan; Asian Cultural Center, New York City; British Computer Society, London; SIGGRAPH Art Gallery; ISEA; CAA; Les Abattoirs Museum, France; Mons Memorial Museum, Belgium; Royal Institution of Australia; Danish Poster Museum; GAMEc Modern and Contemporary Art Gallery, Italy; Athens Digital Art Festival, Greece; Taksim Republic Art Gallery, Istanbul; FILE, Sao Paulo; Korea Visual Information Design Assn.; Goethe Institute Alexandria, Egypt; Stanford University; public collection of the WRO Media Art Center, Poland; Waikato Museum, New Zealand; Moravian Gallery in Brno, Czech Republic; SDAI Museum of the Living Artist, San Diego; and Chinese Culture Center of San Francisco. [www.jingzhoustudio.net]