# Chapter 7
# Bridges Among Visualization, Aesthetics, and Technology

**Jing Zhou**
*Monmouth University, USA*

## ABSTRACT

*This chapter presents the motivation, background, implementation, and comparison of two interactive projects created by the same artist—Living Mandala: The Cosmic of Being[1] and Through the Aleph: A Glimpse of the World in Real Time[2]. Living Mandala is an interactive graphics installation that combines real-time data, multi-cultural mandalas, scientific imagery, and cosmological and mythological symbols; this living graphical system is an exploration into uncharted territories of the human soul sculpted by our present time. Through the Aleph is 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; with an unexpected approach to surveillance cameras and global networks, this meditative web project draws the connections between individuals and the global environment, Earth and outer space, eternity and time, and art and science. Built in an open source environment using live data and complex graphics, both projects visualize microcosm (the diversity of human civilizations and perceptions of life) and macrocosm (the unity of humanity and the ever-changing universe). Although one work is responsive to the physical environment while another to the virtual space, each project merges multiple layers of dynamic imagery and symbols related to cultural heritage, cosmology, science, technology, and nature in a globalized society through time and space in the present moment. [3] In spite of the differences in visual expressions and media platforms between the two projects, the quintessential force bridging visualization, aesthetics, and technology emerges from the artist's journey of being a humble student of Life.*

DOI: 10.4018/978-1-5225-5332-8.ch007

## INTRODUCTION

### A Brief Overview of Digital Art

Although the roots of digital art are ancient and varied, digital art came into existence shortly after the development of the computer (Wands, 2006, p. 20), which emerged in its modern form in the 1940s. Human-computer interaction and computer graphics have undergone a large number of improvements in six decades.

During the 1950s many artists and designers, such as Ben Laposky, were working with mechanical devices and analogue computers in a way that can be seen as a precursor to the work of the early digital pioneers. In the early 1960s computers were still in their infancy, only research laboratories, universities, and large corporations could afford to conduct experimentation in the aesthetic application of computers, among which Bell Laboratories was hugely influential in initiating and supporting the early American computer-art scene. The 1960s marked a period of great progress in the development of computer technology with increased interest in computer-generated art. The first exhibitions of computer art took place in 1965: "Generative Computergrafik" in Stuttgart, "Computer Generated Pictures" in New York, and "Computergrafik" in Stuttgart (Shanken, 2009, p. 26), then the Computer Arts Society (CAS) was founded in United Kingdom in 1968. The development of digital art during the 1970s was characterized by artists' continuing exploration of technology (Wands, 2006, p. 25); a number of artists had begun to teach themselves to program, rather than collaborating with computer programmers. Meanwhile, many prominent influential professional organizations were founded, such as the Association for Computing Machinery (ACM), the Special Interest Group on Graphics and Interactive Techniques (SIGGRAPH), Ars Electronica, etc. The late 1970s had seen the birth of both Apple and Microsoft and the appearance of some of the first personal computers. In the following decade digital technologies reach into everyday life with the widespread adoption of computers for business and personal use, which led to rapid advances in the creative use of computers, combined with the popularity of video and computer games. During this period, computer graphics, animation, and special effects developed quickly and began to be used in films and television programs; educational institutions started to teach computer art on a formal level. The development of graphics software and affordable inkjet printers entered popular culture and simplified the digital-imaging process using the computer. Much of the works of this period demonstrated a computer-generated appearance.

Interest in the digital arts continued to increase throughout the 1990s and 2000s. The speedy growth of the Internet in the mid-1990s dramatically changed the society and modern human life. Increasingly the interaction with computer-generated content has become more prevalent with the emerging tools for artists and researchers, such as Visual Basic (1991), Java (1995), JavaScript (1995), vvvv-Meso (1998), MaxMSP (1999), Processing (2001), Arduino (2005), openFrameworks (2005), RepRap (2006), Raspberry Pi (2012), etc. Alongside digital imaging, digital sculpture, digital installation, computer animation and video, music and sound art, performance, video game, new forms of digital art continuously emerge and push the boundaries of creative expression, such as interactive art, virtual reality, net art, software art, generative art, and more. Many artists like Nam June Paik, Lynn Hershman Leeson, Rafael Lozano-Hemmer helped to establish the reputation of digital art as a serious art form. Today digital art continues to flourish and gradually incorporates into the mainstream contemporary art scene in museums and galleries.