Chapter 11
Connecting the Dots:
Art, Culture, Science, and Technology

Jing Zhou
Monmouth University, USA

ABSTRACT

This chapter presents the motivation, background, and implementation of Living Mandala: The Cosmic of Being[1], an interactive graphics installation that combines real-time data, multi-cultural mandalas, scientific imagery, and cosmological symbols. Built with an open source programming language and environment, this living contemporary symbol is an exploration into uncharted territories of the human soul sculpted by our present time. Its interactive revolving graphical system visualizes our perceptions of life (microcosm) and the universe (macrocosm), our connections to ancient mythology, cosmology, and cultural heritage, and the relationships among humankind, science, technology, and nature in a globalized society. Merging rich historical, cultural, and scientific imagery and symbols with real-time data and relaxing sound, this living organism alters every moment responding to the movement, color, light, sound, and temperature of its surroundings.[2]

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

DOI: 10.4018/978-1-4666-8142-2.ch011

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), openFrameworks (2005), Arduino (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.

WHAT IS MANDALA?

The vegetative universe opens like a flower from the earth's centre,
In which is eternity.

William Blake (Gilchrist & Gilchrist, 1880, p. 237)

In Sanskrit, mandala means secret circle and center—the symbol of the cosmos in its entirety, while the square is the symbol of the Earth and human-made world. Its traditional design hence often consists of a series of concentric forms, suggestive of a passage between different dimensions. In this essence, it pertains not only to the Earth but also to the macrocosm and microcosm, the largest structural processes as well as the smallest. It is the gatepost between the two. Thereby the mandala is a living structural matrix subjected to the infinite processes of growth and transformation by the virtue of the ever-changing relationships both internal and external to its basic structure (Arguelles & Arguelles, 1974, p. 12). The center is the beginning of the mandala, the origin of all forms and processes, and ultimately the eternal potential. The center of the mandala is not only the external space but also of time. The center