Living Mandala: The Cosmic of Being

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Abstract
This paper presents the motivation, background, and implementation of Living Mandala: The Cosmic of Being, an interactive graphics installation that combines real-time data, multi-cultural mandalas, scientific imagery, cosmological symbols, and sound. 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 cultural traces—art, history, science, and technology—this living organism alters every moment, responding to the movement, color, light, sound, and temperature of its surroundings. Following ancient quests, it separates indigenous mandalas from traditional cultural context to build one that is contemporary and universal.

Keywords

Introduction

What is Mandala?
The vegetative universe opens like a flower from the earth’s centre,
In which is eternity.

William Blake [1]

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. [2] 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 of time is now. [3] When living in the present, one’s physical existence and position in consciousness unfold like a mandala at the center of one’s own compass, awareness, and experiences. Expanding from its center, mandala is a manifestation reflecting human consciousness and perception of the universe in their present time, which continually appeared in rituals and art forms throughout history.

Digital Artworks Inspired by Mandala
Although the roots of digital art are ancient and varied, digital art came into existence shortly after the development of the computer, which emerged in its modern form in the 1940s. [4] During the six decades of human-computer interaction and computer graphics development, mandala and its abstract symbolic form have continuously influenced artists to explore and create new artworks digitally. James Whitney’s astounding analog film, “Yantra,” (1957) anticipates the digital visual effects of brother John Whitney’s “Catalog” (1961) and mandala-like symmetry of James’ “Lapis” (1966). In the tradition of cymatics, pioneered by physicist Ernst Chladni in the late-eighteenth century, “Protrude/Flow” (2001) by Sachiko Kodama and Minako Takeno interactively transforms three-dimensional patterns in black magnetic fluid to stimulate viewers’ most primitive emotions, which appears to be choreographed to its sonic environment. [5] “Nanomandala” (2003) is an installation by media artist Victoria Vesna, in collaboration with nanoscience pioneer James Gimzewski. It projects images in evolving scale from the molecular structure of a single grain of sand to the recognizable image of the complete mandala, and then back again. Inspired by Buddhist and Islamic art, Anne Spalter manipulates city footages around the world to develop patterned compositions that explore the concept of “modern landscape” in her works such as “Meditations” (2014).

Rationale and Objective
Where is the Life we have lost in living?
Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?

T.S. Eliot [6]

As a Chinese artist living in the Western world who continuously explores visual art and cultures, it is astonishing
for her to realize that certain universal symbols appear in different cultures and represent eternity, divinity, and harmony. One of those is mandala, the symbol of the round of life and death, of the cosmic procession of beings, planets and stars, of earthly seasons and galactic cycles. Whether it is the Chinese I-Ching, Navajo ceremonial sandpainting, Tibetan meditation sandpainting, or Aztec calendar, mandalas present views of humankind as the microcosm through their own compasses. Since our world has dramatically transformed in the past two hundred years and the stages of human development remain the same as they were in the ancient times, the artist’s intuition led her to wonder what a contemporary mandala would be, for which this project was created.

Digital media provides a means for artwork to consist of motion, time, light, data, sound, and interactivity, which serve artists to envision and represent the complex message of their work. Living Mandala: The Cosmic of Being is a new approach to visualize mandala, an ancient art form, in a contemporary context using digital technology.

The three components of this project present three different timeframes:

- The thirty-six colorful mandalas from sixteen cultures on the bottom layer represent the past five millennia;
- The fifteen white semi-transparent graphics of human studies on the middle layer represent the past five hundred years;
- The real-time computer generated interactive graphic system on the top layer represent now, the center of time.

When the three images from each group overlap representing different times and human consciousness simultaneously, Living Mandala is born, which connects art, culture, science, information, and technology from the past to the present in a harmonious and meditative unity (Figure 1).

In his most influential theological work Pensées, Pascal said, “Man is but a reed, the most feeble thing in nature; but he is a thinking reed… All our dignity consists, then, in thought. By it we must elevate ourselves, and not by space and time which we cannot fill.” The multicultural mandalas and graphics of human studies on the bottom and middle layers are the visual representations of human thoughts in various fields including cosmology, mythology, mathematics, physics, chemistry, and more. These fine images are as if the atoms of an intellectual sphere coming out of our past. When this beautiful sphere blends with real-time interactive graphics representing now, this marriage signifies human cognition as a whole through a condensed timeline. Such sophisticated and universal visual experience with appropriate sound effects could communicate with the audience from various backgrounds at mental, spiritual, sensory, and emotional levels. This experience might lead to deeper contemplations among the viewers, so that the seeds of knowledge could be sowed in accordance with each viewer’s inner compass.

Living Mandala: The Cosmic of Being not only reflects our present awareness and perceptions of the universe, but also investigates the changing relationship between humankind and its environment since the Industrial Revolution. The objective of this work is to expand aesthetic experience and enhance human perceptions of the rapidly changing global environment, the universe, and the center of being. Enriched by profound cultural heritage, this dynamic and symbolic graphical system bridges ancient mandalas, cosmological icons, scientific and technological studies, nature elements, and real-time interactive graphics, through which new meanings and imaginations emerge.

Making of This Mandala

Using known technology, this project was built with Processing (an open source programming language) and Arduino (an open source hardware).

Edward Tufte, a pioneer in information design and data visualization, stated that among the most powerful devices for reducing noise and enriching the content of displays is the technique of layering and separation, visually stratifying various aspects of the data. With complex graphics throughout human history and intricate interactivity, the system consists of three overlapping layers each representing a different timeframe, shown in Figure 2. The bottom layer contains multicultural mandalas in five thousand years of history; the imagery on the middle layer shows human researches in the past half millennium; the top layer generates real-time interactive graphics responding to the movement, color, light, sound, and temperature of its surroundings.

The Bottom Layer

On this layer is a looping animation of thirty-six mandalas and cosmological circular imagery collected from sixteen
cultures in five millennia. The image changes calmly every five seconds.

In order to make a diverse and balanced mandala collection from world cultures as many as the artist could find, the searching and selection process is both time-consuming and rewarding, because some ethnic groups created many more mandalas than others.

The sequence of the thirty-six mandalas was organized in accordance with the aesthetic quality and cultural diversity, which the artist intended to present in the project. Mandalas were often used in rituals and ceremonies of many spiritual traditions for focusing attention, meditation, and establishing a sacred space, so it is important to inherit such aesthetic, meditative, and integrative qualities in this digital mandala, which would bring a sense of beauty, tranquility, and relaxation to the audience. As a result, in order to ensure smooth transitions from one mandala to the next, the image sequence was carefully arranged to harmonize the changes of colors and symbols from each mandala to the next. Meanwhile, this interactive mandala was designed to reflect our contemporary consciousness and perceptions. As the Internet and air travel enable millions of people today to experience different cultures with great speed, not showing two mandalas from a similar culture in a successive order is more suitable to visualize this concept than grouping mandalas by regions or cultures. Therefore, this seemingly random sequence of mandalas indicates a dynamic and globalized society in which we live.

Here are the thirty-six mandalas divided into twelve groups in alphabetical order.

Africa
  - African Bwa Sun Mask
Australia
  - Aboriginal Painting (20th Cent.)
Central Eurasia
  - Scythian Kelermes Mirror (6th Cent. BC)
Far East
  - Chinese I-Ching and Zodiac (30th Cent. BC)
  - Chinese Zodiac Bronze Mirror (7th Cent.)
  - Chinese Cosmological Mandala (12th Cent.)
  - Chinese 100 Longevity Characters
  - Japanese Mandala (17th Cent.)
Hinduism
  - Hindu Chakra
  - Indian Sri Yantra
  - Jain Meditational Yantra (17th Cent.)
Judaism
  - Jewish Merkabah Mysticism
  - Jewish Sepher Yetzirah Wheel
Middle East/Mughal Empire
  - Arabic Miniature (16th Cent.)
  - Egyptian Zodiac (50 BC)
  - Islamic Mosque Ceiling, Tr (15th Cent.)
  - Mughal Emperor Shamsa (17th Cent.)
Multiple cultures
  - Aztec, Greek, and Egyptian Ouroboros
North America
  - Diegueño Ceremonial Sandpainting
  - Navajo Ceremonial Sandpainting 1
  - Navajo Ceremonial Sandpainting 2
South America
  - Aztec Calendar
  - Maya Calendar
Tibet
  - Tibetan Mandala
  - Tibetan Sandpainting 1
  - Tibetan Sandpainting 2
  - Tibetan White Tara Mandala
Western Europe
  - Byzantine Art and Zodiac (13th Cent.)
  - Celtic Bronze Disc (500BC–500AD)
  - Celtic Cross
  - Chartres Cathedral Labyrinth, Fr (12th Cent.)
  - Christian Celestial Maps (18th Cent.)

Figure 2. Diagram of Living Mandala. © Jing Zhou.
The Middle Layer
Slowly moving in a counterclockwise rotation the middle layer consists of fifteen white semitransparent circular graphics, carefully selected by the artist, in a random sequence indicating the dynamic change in the past five centuries. Every graphic image was either designed by the artist or recreated digitally based on a public domain image. Those images represent human studies and perceptions of the world and the universe, among which are the Vitruvian Man, the path of Venus relative to the Earth over eight Earth years, the constellations, the golden ratio pentagram, the planetary orbital paths, phyllotaxis patterns, the Seed of Life, Galactic Geometry, the Platonic solid – dodecahedron, GPS satellite constellation, atom diagram, and the illustrations representing Industrial Revolution, information technology, sound waves, and the electric field.

The Top Layer
In a clockwise rotation the top layer representing now contains two sections: a circular pattern of nine nature icons appearing randomly one after another and an animated interactive vector graphic system programmed in Processing.

Albert Einstein wrote, “A human being is part of a whole, called by us ‘Universe,’ a part limited in space and time”. [10] Although this art project bridges many aspects of humankind in art, history, culture, mythology, cosmology, science, technology, anthropology, etc., it is equally important to combine classical elements and basic components from the natural world, which are part of the universe. For instance, in classical thought the four elements earth, water, air, and fire frequently occur in ancient Greece, China, and India. Thus the following nature icons were created by the artist for this project: water, fire, mountains (earth), stars, leaves (wood), wind (air), feathers, shells, and animal tracks.

This interactive vector graphic system was designed to be able to see, hear, feel, and think, as if it was a creature, shown in Figure 2. The live video feed and motion detection allow it to see; the audio detection makes it sensitive to sound; the changing colors synchronizing with online weather data of the local temperature indicates how it feels; the color alternation and movement determined by algorithm enable it to think.

The Installation
Living Mandala: The Cosmic of Being can be presented on monitors and projection screens. All external hardware devices are packed in a custom-made black acrylic box. The background sound is a combination of meditation music and chanting from different cultures. However, this project could also be shown in silence or with white noise.

The Conclusion
The interactive graphics installation presented in this chapter connects the potential of digital technologies with traditional art, culture, mythology, and scientific studies, in order to create aesthetic and meaningful experiences for diverse viewers. Living Mandala: The Cosmic of Being is much more than an animated interactive infographic. It transcends the concept of mandala and touches the core components that matter today: mixing multiple data streams in a single platform; building an environment for consideration of data in cultural and temporal realms; presenting a framework in the context of human history; and packing striking and universal visual components and conceptual thinking into a limited presentation space. Furthermore, it translates the dynamic contemporary cultural landscape—a modern approach to an ancient quest—to enhance human cognitions and perceptions of the universe and humanity in our time.

References
7. Jose Arguelles and Miriam Arguelles, Mandala, 34.

Author(s) Biography(ies)
Born in China, Jing Zhou is a multimedia artist, designer, and educator in USA. Her work has been widely shown and collected internationally including: Triennale Design Museum, Milan; British Computer Society, London; Asian Cultural Center, New York; SIGGRAPH Art Gallery; ISEA; Royal Institution of Australia; Danish Poster Museum; Sardinia Film Festival, Italy; Athens Video Art Festival, Greece; Taksim Republic Art Gallery, Istanbul; FILE, Sao Paulo; Korea Visual Information Design Assn.; Goethe Institute Alexandria, Egypt; Hungarian Electrographic Art Assn., Budapest; Mundaneum, Belgium; Brown University; public collection of the WRO Media Art Center, Poland; Waikato Museum, New Zealand; SDAI Museum of the Living Artist, San Diego; and Chinese Culture Center of San Francisco. [www.jingzhoustudio.net]