



LIVING MANDALA: THE COSMIC OF BEING

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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 unites indigenous mandalas from diverse cultural contexts to create one that is contemporary and universal.

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1 INTRODUCTION

1.1 WHAT IS MANDALA?

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

William Blake (Gilchrist 1880)

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 1974) 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*. (Arguelles 1974) 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.

1.2 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. (Wands 2006) 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. (Shanken 2009) "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).

1.3 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 (Eliot, 1934)

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. (Arguelles 1974) 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.

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.

2 MAKING OF THIS MANDALA

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. It 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. (Tufte 1990) With complex graphics throughout human history and intricate interactivity, the system consists of three overlapping layers each representing a different timeframe (Fig. 1):

- 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 and nine nature icons 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 (Fig. 2).

Fig. 1. The diagram of *Living Mandala*.
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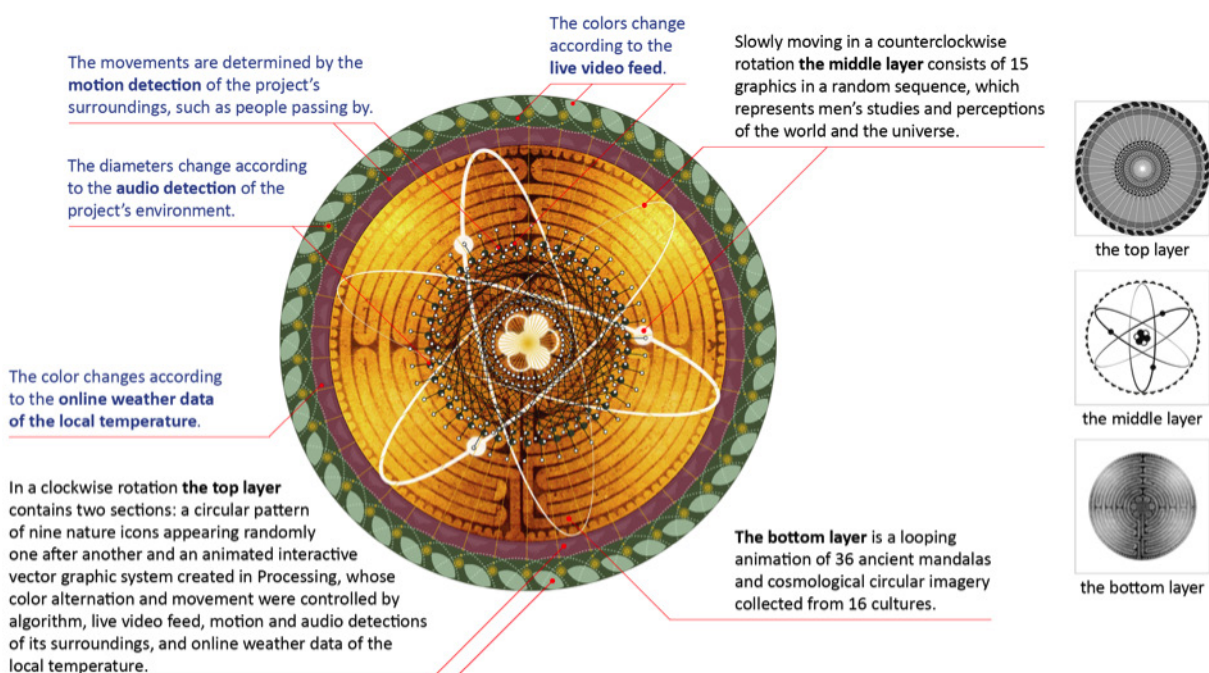




Fig. 2. A screenshot of *Living Mandala*: Tibetan Sandpainting Mandala by Tibetan Buddhist monks from the Drepung Loseling Monastery, Information Technology, Wind. © Jing Zhou.

2.1 THE BOTTOM LAYER

On this layer is a looping animation of thirty-six mandalas and cosmological circular imagery (Fig. 3) 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.

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.

2.3 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 time and space”. (Einstein 1972) 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 (Fig. 3) were created by the artist: 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, shown in Fig. 1. 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.

CONCLUSION

The interactive graphics installation presented in this paper 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.

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