

Possible Applications of the Metaverse Concept in Sculptures

Yu Yang¹ Lisheng Zhang²

^{1,2} Xiamen Academy of Arts and Design, Fuzhou University, Xiamen, Fujian, China

¹Corresponding author. Email: 201727003@fzu.edu.cn

ABSTRACT

Metaverse is the latest development stage of visual immersion digital technology, which is a virtual space independent of the real world. Any effective information in the real world can be mapped in the virtual space to realize the jump and shuttle of information dissemination and provide the possibility to break the limitations of space and time. This paper studies the possible applications of the Metaverse concept in sculpture art, analyzes the generating factors of the Metaverse concept, and redefines the artistic spatial language of sculpture through the immersive experience mode of Metaverse technology, so as to realize digital creation, portable storage and the embodiment of sculpture value in the virtual world. It is hoped to interpret the Metaverse concept in an easy-to-understand way from the perspective of sculpture art and provide theoretical support and direction guidance for the development of sculpture art.

Keywords: *Metaverse, Sculpture, Space, Technology.*

1. INTRODUCTION

The hottest term in 2021 is "元宇宙", which is Metaverse in English, a combination of the prefix "meta" (meaning transcendence) and the suffix "verse" (meaning universe), which literally means the universe beyond matter or beyond the universe. "The term Metaverse first appeared in Neal Stephenson's 1992 novel Snow Crash".[1] In the novel, VR goggles and stereo headsets are used to immerse yourself in the concept of beyond time and space. Humans as avatars interact with the world, with a future technology that combines virtual reality, augmented reality and the Internet's virtual shared space. Then, the first digital practice of the Metaverse concept ushered in the launch of massively multiplayer online games such as "Second Life", "Minecraft", and "Sandbox Games", and now it is officially recognized at the public level. So why is the concept of the Metaverse being re-proposed? What effect will this have on sculpture art?

2. THE CONCEPT OF METAVERSE

In November 2021, Roblox used \$10 million for the investment plan of Metaverse education and

sold the first shares of the Metaverse concept. Subsequently, the Internet giant Facebook announced at the Internet conference that it would change its name to "META" and march toward the Metaverse cause. "In the '2020-2021 Metaverse Development Research Report' released by the New Media Research Center of Tsinghua University, the Metaverse is defined as a new Internet application and social form that integrates virtual reality, blockchain, cloud computing, digital twin and other new technologies, closely integrating the virtual world and the real world in economic systems, social systems, and identity systems, and allowing each user to produce content and edit the world".[2] Chinese Internet manufacturers have also proposed to transform themselves into Metaverse enterprises. The birth of the Metaverse has aroused the attention of all walks of life and set off a wave of the Metaverse.

Only by knowing about the old material can it be possible to gain new insights. Human civilization has entered the eve of the Metaverse. Under the feast of the continuous influx of capital and technology, it is also necessary to think carefully and calmly: What is the Metaverse? There is no generally accepted definition of the core concept of the Metaverse. In terms of theory, the

concept of the Metaverse itself is related to Western religious and cultural beliefs. It is believed that the universe originated from the idea of God, and the so-called creation of God is actually the materialization of activities with ideas. Under this religious idealistic worldview, it is easy to package the information world presented on the retina into a "universe" in a spiritual sense. Therefore, the information world beyond reality is called a "Metaverse". The development of science and technology will affect the continuous change of communication media technology and media technology also promotes the change of human social formation. When society and technology develop to a certain extent, the communication media will produce a matching development form, and the Metaverse emerges spontaneously. In terms of technology, it is considered to be related to independent future technology industries such as chip, cloud computing, artificial intelligence technology (AI), virtual reality technology (VR), and augmented reality technology (AR) and will gradually achieve unity under the gravitational force of the Metaverse. "The integrated network of the Metaverse is technologically dependent on advances in four aspects: immersive realism, ubiquitous access and identity, interoperability and scalability. A virtual world is an everlasting online computer-generated simulation of a three-dimensional object or environment. In such an environment, multiple users at remote physical locations can interact in real-time for work or entertainment purposes".[3] Its experience is based on visual-auditory stimuli and textual stimuli, emphasizing a sense of creativity, analysis, instruction and practicality, reflecting a shared holistic online space in all dimensions. The Internet has already set off a wave of decentralization and heterotopic virtual space will further promote this trend, creating new modes of experience.

3. METAVERSE IMMERSIVE EXPERIENCE MODE

When the media model of the Metaverse is used for art exhibitions, it will produce a different artistic experience. In 2012, the Virtual Gallery at Weekends in Berlin (VGWB) opened, and the public could use avatars to enter this 3D space, a space showcasing the exhibition halls of Berlin's 51 major contemporary art galleries, each of which was located on a map of Berlin. This is an attempt of art in a computer-created virtual space exhibition, allowing visitors to feel the shape and weight of works of art from anywhere via the Internet. The

gallery's exhibition form has undergone subversive changes in the context of technology. If technology develops to the Metaverse stage, when the virtual space is sufficiently realistic, can participants be psychologically and emotionally immersed in another world? The answer is yes. "Immersion means that people devote themselves to a certain activity, not affected by other factors of the surrounding environment, achieving a psychological state of extreme pleasure".[4] A fully realized Metaverse for ultimate immersion must provide an environment for human culture and interaction, just like the physical world. Metaverse generates virtual space environment through computer, which satisfies users' psychological and emotional investment in the environment and is more realistic. The visual presentation of the virtual world provides the same rich information as the real world and produces the same state of visual immersion in the real world. In the field of artistic thinking, by providing online exchange of impressions, ideas and information and satisfying the sensory behaviors required by human vision and perception, an immersive and realistic artistic state can be achieved. Immersive experience is considered to be at the core of virtual world realism. Immersive experiences are greatly facilitated by human presence and interaction, a time during which people allow themselves to believe that these immersive experiences are real. When the virtual space satisfies the immersive viewing experience of human beings, will the spatial language of the sculptures created in the virtual world change? Can the immersive experience mode bring new opportunities to sculpture art? The author will answer them one by one.

4. POSSIBLE APPLICATIONS OF SCULPTURE ART IN THE CONCEPT OF METAVERSE

4.1 Redefined Sculpture Spatial Language

As a socialized virtual world, the Metaverse brings unprecedented opportunities for artists to merge every corner of the real environment with digital creation. As an immersive digital space, it is the construction of visual perception, thus producing a different sculpture art space. In the real world, "The spatial language of sculpture consists of five stages: ontology space, positive and negative space, architectural interaction, field space and relational aesthetics".[5] Influenced by the concept and technology of the Metaverse, the original spatial language stage is broken and a new

sculpture spatial language is generated, which is temporarily defined as "the Metaverse's spatial stage". With the commercialization of virtual reality technology, this idea can be made possible. For example, Tilt Brush launched by Google extends the scope of sculpture to virtual space and the work realizes the basic function of image, sound and story communication. Compared to the previous sculptural spatial stage, it is a combination of science and art. It integrates VR technology into practice, the viewer's artistic experience mode migrates from the real world to the virtual world, and the space in the virtual space becomes a plastic dimension, stripping away the viewer's original spatial perception and regional limitations, trying to connect the spatial language of any place in the world. Space-time distances become insignificant, virtual and real spaces become equivalent, and language barriers may be temporarily removed, solving the problem of difference. Sculptures created in the virtual world create a new spatial language in the original relational aesthetic stage, expand the new concept of human existence in real time, present a more direct sense of shared space and mutual existence and also guide the viewer to think about how the aesthetics of technology will drive the development of the essence of sculpture.

4.2 Opportunities Brought by the Metaverse to Sculptures

4.2.1 Digital Creation

Digital creation is an extremely convenient way for art. Since the popularity of computers in the 1970s, artists have repeatedly tried to use computer equipment to express their thoughts and ideas, making difficult concepts more accessible to audiences. The earliest publicly exhibited computer artwork can be traced back to computer graphics by artist Georg Nice, exhibited in Stuttgart, Germany in February 1965. Since then, the process of artistic creation has been enriched by the support of digital media and computer equipment. Then, a series of computational media arts such as computer-aided fractals and three-dimensional fractals are produced. Currently in the field of sculpture art, advances in artificial intelligence (AI) have dramatically changed the way sculptures are created, with computer software effectively producing virtual artworks in a real-time interactive 3D environment. When technology develops to the Metaverse stage, it emphasizes the fusion of virtual reality and physical reality. This stage is to present the characteristics of visual art simulations over time,

using virtual cyberspace and physical space as canvases to create extremely diverse artworks. Here, Plato's worldview coexists with immaterial and phantom objects, the combination of surface textures provides the skin for the artwork, the real-world gravity and wind can be invoked, the flowers, trees and tall buildings in the environment can be simulated, and the near-realistic rendering gives real-life characteristic effects. It is easy to undo an operation or return to a certain stage of creation during the creative process, allowing artists to make trial and error in the design process that is difficult to achieve in the real world until a satisfactory result is achieved. When technology reaches a certain level, artists may no longer rely on objects to operate alone, and they even just need to import a simple thinking model into the virtual space created by the Metaverse to generate the desired sculptural artistic effect. This is not only impossible for sculpture art in the real world, but also an innovation brought by the development of Metaverse technology to sculpture art.

4.2.2 Portable Storage

In the real world, the preservation, transportation, and display of sculptures are resource-intensive and labor-intensive, but in the Metaverse, these are extremely easy: With simple instructions, it can achieve the required behaviors such as display, sale, transmission, and interpretation, reducing the utilization of real social resources. The preservation of sculptures has changed from traditional entities to digital storage, relying on the network to facilitate transmission anytime and anywhere, and is no longer displayed with expensive physical effects. Sculpture data visualization can be transformed into 3D models in an aesthetic and understandable way, not only to view from the screen, but also to interact around the model in the virtual world, and in the form of no resource loss, the display effect required in reality can be met for the public to watch. Unlike traditional sales, the virtual world can help consumers build a virtual showroom that is visible and perceptible at any time, rather than facing a limited selection panel. Consumers can buy the sculptures they want according to their personal preferences and needs, the original consumption experience can be changed, and a new marketing business model can be formed. Metaverse technology can also be used as a means in sculpture teaching. Teaching resources, authoring tools and learning styles are redefined in a virtual space environment. It is possible to access the creative

video of a master at any time, providing students with low-cost research teaching that is not limited by physical distance and existing facilities. In the virtual environment, students have direct access to the guidance of teachers and artists at any time, establishing closer connections and providing teachers and students with a richer and more engaging way of teaching than the flat network.

4.2.3 *The Value, Validation and Transaction of Sculptures in the Metaverse*

When the sculpture art mixes together with Metaverse technology, the value, ownership and transaction of sculpture works in the virtual world become a major problem. The virtual world belongs to the emerging creative economy and its role in the future real world economy has not yet been clearly defined, but it is indeed an important economic entity that exists. Currency as a medium for measuring prices can also quantify the value of virtual items and creations in the future to facilitate their trading and exchange. The assets in the virtual world are gradually digitized and virtualized and corresponding digital currencies will also be generated. Non-fungible tokens (NFTs) are currently emerging in the virtual world. More and more creators and traders are starting to pay attention to the rise of virtual markets. Non-fungible tokens reveal challenges related to the scarcity and identity verification inherent in digital artworks, encourage the participation of younger generations, expand the overall scope of the art community, and stimulate artists to enter the Metaverse and expand new frontiers of art. "The Metaverse features a virtual market powered by blockchain technology, which facilitates point-to-point item transactions in the Metaverse. It is worth mentioning that the trading of (art) works is the basis for building the Metaverse community, where creators or artists will spend a lot of time creating new and creative content in the Metaverse".[6] Non-fungible tokens endow digital artworks with additional interactive properties. Sculpture creators can create or mint non-fungible tokens as work ownership certificates, and transfer these non-fungible tokens to the collector, and in this way, publicly identifiable ownership can be established in virtual objects that are susceptible to piracy and counterfeiting. It is essentially a decentralized database, which is recorded by countless devices around the world with a distributed node consensus algorithm, which can't be tampered with and forged by individuals, protecting the rights and interests of

everyone. The development of the Metaverse concept has subverted the cognition of the traditional sculpture art industry and brought new opportunities at the same time.

5. CONCLUSION

The concept of Metaverse is the current people's imagination and thinking about the future social development form and it is also an inevitable product of the development of science and technology to a certain stage, providing a new way for the digitalization process of humans. The development of science and technology promotes the realization of the Metaverse, and the virtual and reality of the Metaverse promotes the innovative development of sculpture art. This is the fusion between science and technology and traditional art and is also the result of the interaction between intelligent systems and humans in the context of art, allowing a new dynamic relationship between artists and audiences to be formed with a harmonious coexistence model. Metaverse technology enables artists to directly create an imaginary inner world and also realizes more possibilities for the future development of sculpture art, driving sculpture to move forward to the essence of art.

AUTHORS' CONTRIBUTIONS

Yu Yang analysed data, and Lisheng Zhang wrote the manuscript.

REFERENCES

- [1] Yu Guoming, Geng Xiaomeng. Meta-universe: The future ecological prospect of media-oriented society [J]. Journal of Xinjiang Normal University (Philosophy and Social Sciences Edition), 2024,43(03): 110-118+. (in Chinese)
- [2] Li Hongchen, Ma Jie. Reconstruction of "Human, Field, and Object" in Metaverse Library from the Perspective of Immersive Theory [J]. Information Science, 2022,40(01):10-15. (in Chinese)
- [3] Dionisio J D N, Iii W G B, Gilbert R. 3D Virtual worlds and the Metaverse: Current status and future possibilities[J]. Acm Computing Surveys, 2013, 45(3):1-38.
- [4] Guo Yajun, Yuan Yiming, Guo Yiruo, Li Zefeng. Research on Knowledge transfer

mechanism of Virtual Education from the perspective of meta-universe [J]. *Information Science*, 2022, 40(01): 3-9+24. (in Chinese)

- [5] Yang Yu, Zhang Lisheng. Sculpture Spatial Language about "Placement" [J]. *Sculpture*, 2021(06): 74-75. (in Chinese)
- [6] Lee L H, Lin Z, Hu R, et al. When Creators Meet the Metaverse: A Survey on Computational Arts [J]. *arXiv preprint arXiv:2111.13486*, 2021.