Activation and Transfer: The Application of Digital Media in Environmental Art Design

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Abstract: *In the flood of the digital age, the field of design has ushered in an unprecedented development opportunity, which not only enriched the connotation value of its art form to the greatest extent, promoted the reform and change of the design concept, but also produced a brand new expression mode and design language in the design expression. The digital era has created a new design concept based on virtualization, innovation, and interaction, which promotes the rapid development of the field of environmental art design. Based on the analysis of the basic principles that digital media should follow in the application of environmental art design, this thesis discusses the application strategy of digital media in environmental art design.*

Keywords: *digital media; environmental art design; spatial activation; morphological transfer; application*

1. Introduction

With the rapid development of time and the progress of science and technology, the traditional environmental art design concept and model can hardly meet the requirements of social development and the actual needs of users. In 1964, Canadian scholar Marshall McLuhan broadened his understanding of media in his book "Understanding Media", including all extended human bodies spanning language, text, clothing, housing, currency, clocks, etc. The "signifier" realm of "media" includes both the innervation sense and the "intermediary" through which society and nature interact. [1]A "medium" is broadly defined as "any extension of a person". [2]Print media is n extension of vision, radio is an extension of hearing, television is a comprehensive extension of audio-visual, and digital media is any medium that communicates and interacts in digital form. Paul Levinson abandoned McLuhan's media thought and emphasized that people, as the subject of communication culture, should give full play to their subjective initiative when using emerging media technology. "Humanization trend" will be the direction of media development.[3]The use of each medium will change people's sensory balance, resulting in different psychological effects and ways of understanding and responding to the external world. In this context, digital media has become an important support for the innovative development and dissemination of environmental art design. It not only provides more sophisticated technological assistance, but it also injects living energy that seems genuine and illusory, and it supports the expression of the environmental art design to progress toward Diversified growth.

2. Basic Principles in the Application of digital media in environmental art design

First and foremost, there is integration and engagement. The application of digital media in environmental art design mainly integrates computer simulation technology, graphics technology, sensor technology, artificial intelligence, network parallel processing and display technology, and other advanced technological development achievements, so that the audience can interact with virtual design works effectively interact with each other and give full play to the intrinsic value of the work. Various social media have infiltrated every corner of life, building a "virtual communication space" juxtaposed with the "offline space", which has realized the seamless connection between reality and virtuality to a certain extent, and not only changed the connotation of interpersonal relationships, logic, and meaning have also given birth to a new social ecology. From the perspective of communication[4], Du Junfei defines digital communication in the virtual world with the background of Internet communication as "communication-action in the virtual society.[5]Human-computer interaction, which transmits and reflects the designer's intellectual core and values, will be a significant manner of expressing space in the future.

Second, consider the creative design shape. At this stage in the environmental art design process, computer software is primarily used to simulate the reality of environmental art. The design concept and impact are reflected in the scenario. Simultaneously, it may help the designer optimize the design content from different perspectives and encourage the shape, style, and color of the design work to be adequately matched with historical, regional, local, and other elements. Perfectly achieve the creative impression of the design.

Third, there is scientific validity and authenticity.   Before applying digital technology, designers must comprehensively inspect the actual environment and collect genuine data information, to provide troubling support for later art design. Automate design with the help of a digital media plan, and improve the design layout, to obtain the most accurate, three-dimensional, and detailed design planning[6]. Although digital media constructs a virtual space-time relationship, for environmental art design, it is only with the help of this tool and platform to better realize and beautify We live in reality, so the historical culture is preserved based on the science of reality, to realize the transformation from virtual to real place spirit.

3. The application strategy of digital media in environmental art design

3.1 Spatial Activation and morphological transfer

Traditional environmental art design, including architecture, garden, and interior design, usually presents the design results to users with the help of graphic mode. Generally, the design is spread through two-dimensional and three-dimensional graphics. Users must fully develop their thinking ability and spatial imagination ability to comprehensively understand the design effect because even three-dimensional design renderings are difficult to totally and systematically present all data information. The influence of these factors hinders the steady quality and efficiency improvement of traditional architectural design. As a result, by fully using digital media, inadequacies in conventional space design may be supplemented to some level. The flexible use of related computer software systems can help to simulate realistic and three-dimensional building sites and surrounding environments, as well as the overall and detailed presentation of all the details of the space, to continuously improve the design quality and effectiveness.
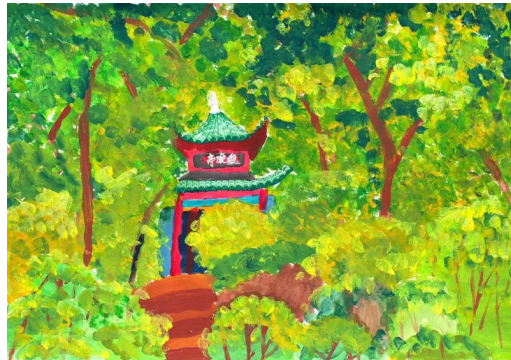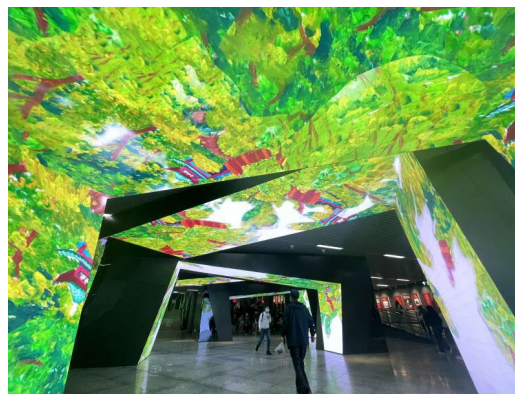

Figure 1: Yuelu Mountain (Tu Si Yuan painting)

Figure 2: Immersive Space Experience

Through multimedia images, VR technology, and other digital media, users can feel the spatial form and sense the spatial intention, which effectively promotes the landing and implementation of the design schemes. Immersive digital display, through holographic space imaging, real-time video synthesis, phantom imaging, and multi-scene change, to show the digital works with artistic design concepts to the audience. The application of new technology in the physical space creates a wonderful audio-visual feast.[7]For example in 2022, the Changsha subway space digital art exhibition —— "New Changsha, Art World", in a modern multimedia way in the subway space to show, bring citizens and passengers an immersive experience, can feel in daily life art, selected works are 8-12 years old children created (figure 1), with the eyes of the children to find the charm of the city, the Changsha temperature and Hunan humanistic feelings (figure 2).

In addition, the application of digital media in environmental art design can fundamentally break through the traditional solidified concept and have a profound impact on the sustainable development of environmental art design. Designers continue to strengthen computer information technology, which can not only break through the limitations and influences of diverse factors in the traditional model, but also deeply stimulate their enthusiasm and initiative in creation, and help the artistic effect of environmental design to be more accurate, efficient, scientific and reasonable.

3.2 Application of VR Technology

VR technology, also known as virtual reality technology, is capable of generating dynamic three-dimensional images. With the assistance of simulation and sensing equipment, it enables the public to experience and perceive from the senses of vision, touch, and hearing, which brings unprecedented feelings to the public. Virtual art is "virtual reality (VR), augmented reality (AR) and other computer graphics technology as a medium means to use art form", " with the help of hypertextual nonlinear narrative structure, time and space in virtual art can be arbitrarily replacement and staggered, VR technology make the audience to the traditional understanding of visual art in the same time and space is multiple perception superposition and enhancement, art itself has become the audience thinking platform."[8]

VR technology has the following advantages in environmental art design:

First and foremost, excellent efficiency. VR has the potential to simplify difficult designs. It offers several advantages, particularly in the development and exhibition of design works. Designers no longer need to spend a lot of work and time creating final models by incorporating VR technology into the process of environmental art design. Virtual models created using VR technology can allow users to feel the impact of the environmental art design and enhance design efficiency.

Second, it has great artistic value. In the picture processing process, VR technology is quite demanding. To precisely display the final impact of design works and assist in constantly raising the value of environmental art design, VR technology must generate accurate 3D modeling and panoramic views. At the same time, the audience may see all of the materials or information required for the development of the piece.

Third, it has a general perceptual impact. The practical implementation of VR technology in environmental art design can fully suit the audience's auditory, tactile, and visual demands. It is capable of creating an immersive virtual world that is similar to reality. The advent of the era of virtual art development provides new technical support, 5G technology, blockchain technology, mixed reality (MR), and human-computer interaction technology development further " strengthened the human perception, broke through the inherent barrier of real material space, make human can enter a not restricted by time and space and cultural block 'virtual space, and this space can be infinite close to the real reality and virtual' mixed space, or completely overhead virtual imagination space." [9]For example, with the help of digital media, the work Starry Night Journey presented on a digital screen in Shanghai Pudong Airport converts Vincent van Gogh's smoothing brushstrokes into waves composed of color particles, and the whirlpool in Van Gogh's eyes on the starry night is reconstructed through the naked eye 3D mode, simulating the world van Gogh imagined. The passengers can see the stars when they look up at the screen. It presents positive, warm, and upward energy from the digital environmental art design for the vast number of passengers[10].

In environmental art design, there are many innovative applications of VR technology. On the one hand, VR technology can simplify the design steps. When using design software to create works, designers need to wear VR headsets to facilitate the corresponding design in 3D virtual space. At the same time, designers can adjust the position of the helmet according to the actual needs. They can not

only complete the creation on the drawing board, but also move the creation interface arbitrarily, and complete the art design works according to their assumptions in the process of building the physical environment. On the other hand, VR technology can simplify the inspection of finished products. The application of VR technology in environmental art design can help designers break through the limitations of traditional design modes and complete the works meticulously and three-dimensionally by constructing virtual spaces that are consistent with the real environment. It is possible to achieve a seamless link between two-dimensional and three-dimensional space, and the completed design works may be evaluated from numerous angles.

3.3 Application of AI Technology

Generative AI is an artificial intelligence that learns the features of objects from data through various machine learning methods, to generate entirely new and original content (such as text, pictures, and videos) [11]. ChatGPT will bring a major change to human society. It will reconstruct traditional ways of production, life, education, work, and so on. Generative artificial intelligence originated from cybernetics in the 1940s. The concept of "artificial intelligence" was first proposed in 1956, in 201 2, the generative artificial intelligence AlexNet model appeared, in 2017, the Google Brain team proposed Transformer architecture, in 2018, Google's large model parameters exceeded 100 million, and the model parameters reached 540 billion by 2022. In 2022, ChatGPT stands out as an excellent representative of generative artificial intelligence. As a generative AI language model built on many advanced technologies, ChatGPT may use its powerful natural language processing capabilities to become a lever for the fourth Industrial Revolution.[12]

In the field of design, ChatGPT combines with mid-journey to create architectural, interior, and landscape environments. ChatGPT can automatically generate frequently related renderings according to keywords, SU draft model, etc. It saves a lot of time, provides diversified creativity, and transfers multi-dimensional activation space forms, which open new ideas for designers and inject vitality to create more possibilities. For example, during Milan Design Week in 2023, Ma Yansong's MAD installation "Momentum" was exhibited in the central courtyard of Cortile'Onore, University of Milan. The reinstalled was shrouded in reflective materials, and the daylight reflected the sky, grass, tree shadows, and classical arcades. , blurring the boundary between objects and the environment, the night installation uses its light to become transparent and ethereal, and the light matrix presents a futuristic temperament. "Momentum" combines virtual art with physical deployments. AR augmented reality technology breaks the barriers of time and space. Audiences can create spontaneously through buttons on social media, and let several reflective cubes based on the installation "Momentum" float in different fields. Under the lens of the sideline, it produces higher aesthetic value and visual impact and realizes the design purpose of revitalizing the architectural space and conveying the artistic form. [13]

It is vital to scientifically manage the degree of digital technology application in the process of practical application, avoid over-reliance on computer systems, and prevent a decrease in self-innovation and creativity.[14] According to the user instruction ChatGPT can in a short period, through the existing language data collection, screening, and integration, along the kind of natural language expression pattern, assist and replace people to complete article writing, social criticism, creative editing should be based on independent thinking of view generation and output tasks. ChatGPT May replace people for independent wonder, individuals' knowledge will be contained by receiving information, back experience, resort to theory, hypothesis, research, test hypothesis, derivation conclusion steps of independent form further to quell typing instructions, copy and paste strides of dependent rediscover, thus induce independent thinking ability.[15]Artistic design comes from independent thinking and imagination. If human beings experience the state of "not thinking" for a long time, it is bound to be an enormous change and challenge to the existing life, work, study, and other aspects.

In different stages of development of human society, social relations with updated iteration, the arrival of the era of the digital citizenry to intelligent materialism, humans don't have to be a single meaningful social relation, but in the future of the media of mutual mapping with the real virtual space, people can create their own "digital surrogate", immersed in the virtual world for social interaction, engaged in economic trade, give full play to the imagination to construct new social situation, to shape a new social relations network, experience their own "second life", and even "infinite life".[16]This may mean that in the meta-cosmic era, humans could gain immortality in an alternative sense ": to experience as many different ways of life as possible in their limited time, or to store their ideas in chips for future generations."The relationship between people and people, the relationship between man and things, and the relationship between machine and things will become the main social

relationship category of an intelligent society."[17]

4. Conclusion

In conclusion, environmental art design, with the support of new media and new technology, further exhibits the aesthetic appeal and value connotation of design works based on the materiality, interaction, and immersion qualities of digital media. Despite many significant changes in AI, this tendency is unstoppable. Architects or designers cannot reinvent their design concepts and methodologies without continual learning and the use of digital technology. Hundreds of cutting-edge design tools and applications have been produced thus far. These tools and strategies can assist designers and related businesses in gaining a competitive advantage in previously unexplored regions.

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