

Research on Space-time Construction and Perceptual Experience of New Media Art Installation

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Abstract. The key characteristics of new media art installations are intelligibility, interactivity, sensitivity, and a strong sense of on-site immersion. To integrate the change of time cycle into the new media art installation and give it a deeper meaning. This paper conducts an in-depth study of the new media art installation itself and gives a detailed explanation from the construction to the formation of the art installation. Use time and space rhythm and illustrate with examples. Optimal integration of visual perception, auditory perception, tactile perception, olfactory perception, and taste perception is used to promote the development of new media art.

Keywords: component; New media art; Perceptual experience; Interaction design; Sound design, taste experience; an Art installation

1 Introduction

With the rapid development of media, new media art has attracted much attention. With their distinctive interaction and immersion, new media art installations play a significant role in new media art and help people view art in new ways. As a result, more and more academics are paying attention to it, and they investigate its historical growth, artistic merit, and commercial significance in great detail. However, with new media art installations, their thoroughness, interaction, and audience sensitivity are more beneficial for study. Therefore, this paper takes the comprehensiveness of new media art installations as the cornerstone to explore the relationship between the concept of time and the construction of space and new media art, discusses the main components of the installations, focuses on interactivity and audience sensitivity, and uses the "five senses" in perceptual experience to analyze the new media art installations to explore whether the perception experience has more research significance and to promote the healthy and orderly development of new media art.

2 Analysis of the composition of new media art installations

A cutting-edge art form is known as "new media art installation" was simultaneously created and developed by multimedia technology and installation art. The new media interactive device uses new materials in addition to new technologies including data programming, human-computer interaction, and mobile media terminal development.[1] Through the unremitting efforts and innovations of generations of artists, new media art installations not only make media art move from "static" to "movement", and make the audience move from "watching" to "participation", but also have a deeper interactive form and a more advanced immersive experience with the promotion of technology.

The primary components of a new media art installation can be loosely split into five categories: theory, installation, scene, linkage equipment, and electronic equipment. It is the artist's art in its most complete form. The design concept of the work and the fundamental principles of production are included in the theoretical concept. These elements directly influence the choice of theme, scenario concept, artistic context, interaction strategy, and other elements of the artwork. Whether it is the installation itself, the scene construction, the linkage equipment, the electronic control equipment, or the viewer and the author, it is all to assist the better presentation of the theoretical concept of the work. Its importance is comparable to the relationship between a movie and a script: "A good movie cannot be separated from a good script, and a movie without a good script will not make a good movie even if the camera technology is superior and the actors have a solid foundation. "In the same way, a good theoretical concept is the first step towards a good device, but theory alone is not enough, we need the cooperation of other components.

The installation itself is the most direct presentation of the concept of the work. It carries the most direct form of expression for the work of art. People have certain psychological expectations when viewing the installation. They explore and discover the deep meaning contained in the installation itself. Hierarchical mysteries and inner hints. Scene construction serves the art installation, and constructs the construction of auxiliary scenes in addition to the installation itself. Its function is to highlight the theme of the artwork, explain the background of the work, and create an environmental atmosphere, to set off the theme that the art installation wants to express. Linkage equipment is added on-demand according to the different needs of artworks, such as projection, sound, lights, sprayers, and machines for making flavors, etc. A series of machines that can be linked with the actual work, its role is to promote the narrative storyline of art installations. It gives the viewers psychological hints and physical perception, lays the foundation for the upcoming interactive plot, and enhances the viewers create an immersive sense of being there. The main body of electronic equipment is mostly computers, and artists use computer technology to design and edit works in advance. Or integrate the required linkage equipment into the computer port, and realize the display and exhibition performance of new media art installations through the application of various software and the operation of computer programs.

3 The space-time construction of new media art installation

3.1 Multi-level construction of prosody in multi-dimensional space

A sophisticated and original design concept is required when building a new media art installation space. The works must cleverly combine architectural design and art installation to make the audience "move" and break the audience's perception of the coldness of the physical materials and built environment. Urban Imprint is a work of art that may travel with the viewer. A faint sinking sound may be heard under the viewer's feet as soon as he enters the gadget. The weight of the viewer will cause the secret pulley device to be activated, which will cause the gadget on the viewer's head to rise like a wave.

Nassia Inglessis, the creator, hid some cables on the back of the mirror to ensure aesthetics and arranged the remaining cables in an orderly manner over the work to create a sense of spatial order and interest. By utilizing digital-analog generative effects, she not only carefully planned the layout of the art installation, but also made use of the surroundings to create a spatial rhythm link between the piece, the setting, and the viewer. As the major component of the gadget, rubber and concrete are combined to create a new material that is then sliced into several pieces that resemble a honeycomb and are joined. This "honeycomb piece" has the dual characteristics of visual impact and structural beauty. When the sun shines through the carved gap, a geometric honeycomb effect of light and shadow is reflected on the viewer and the surrounding buildings. The light and shadow will reflect different textures according to the Angle of the sun and the body of the viewer. (figure1) To offer space for art installation and encourage the audience to exert subjective energy to engage with the work, the concept of space should be ambiguous while creating architectural space scenes and art installations. [2] An excellent installation artwork cannot be separated from the carefully designed space construction, and an excellent concept of space construction can better realize the interactive relationship between people, works, and the environment, and enrich the depth of the art installation.



Fig. 1. Urban Imprint

3.2 Construction of cycle time sequence changes

Looking back at works involving the theme of time in art history, we can see that how artworks introduce time is usually dealt with through the strategy of narration or suggestion [3], but there is a lack of research on the implied meaning and value of time itself. The reason is

that most artworks are exhibited for a short time, so there is no need to consider the influence and change of the cycle of time on the art installation. But considering the time factor in new media art can make it more effortless to walk between virtual and reality. The theme of time is incorporated throughout the majority of Vincent Leroy's outdoor installations. His dynamic sculpture and the digital world come together in Landscape to incorporate the laws of time found in the natural world. Utilizing the refraction theory of light, the translucent concave and convex prisms used in the creation of the piece change the natural scene of shifting natural light throughout the day into various hues and abstract patterns. The piece deftly mixes sculpture, time, and the outdoors. The work is like a beautiful classical poem; each day of the show is a response to the natural surroundings and the passage of time. From "sunrise to the moon", the viewer inspires the desire for life, the yearning for beautiful things, and the feeling of being on the scene.

4 Perceptual research on new media art installations

4.1 Visual perception experience – image, light and shadow

Visual perception is the most direct perceptual feedback for human beings when they face new things. In new media art installations, apart from the feeling brought by the installation itself, this visual perception also includes the visual effects brought by digital images and the art of light and shadow. To fully realise the transformation from a two-dimensional plane to three-dimensional space, realize the multi-layer reconstruction of virtual and reality, time, and space, and realize the breaking of the spatial law of perspective used by conventional images, the video installation embeds the virtual image into the digital network. [4] In 2017, Team Lab's "Flower Dance Forest and Future Amusement Park" exhibition put people in a virtual sea of flowers intertwined with digital images and light and shadow. Each flower is different and will not reappear once it dies due to real-time operational feedback on the viewer's motion capture. The birth, bloom, fade, and wither of the flower are affected by how closely the spectator examines, touches, or steps on it. Only the present moment will exist when the spectator comes into contact with each bloom. The sea of flowers constantly changes the seasons according to the law of the four seasons, and the flowers go through the natural laws from growth to withering. [5] In this visual feast, the author not only gave life to the digital flower sea but also brought visual shock to the audience.

However, the team lab team's new work Resonating Microcosms of Life-Solidified Light Color has once again refreshed people's perception of visual perception. The time of viewing the work affects the effect of the work. During the day, you will see many ovals. The installation reflects the surrounding objects on the green moss, and the scene is accompanied by fog. When the oval installation is pushed by people or blown down by the wind, there will be a sound, and the oval installation will stand on its own. The surrounding ovals responded, echoing the same tone. At night, you will see a glowing secret base, which looks like a spawning cave of some alien creature, giving people infinite reverie, the oval itself will emit faint starlight, when pushed or blown by the wind, the oval light is enhanced and produces different colors of light, and the surrounding oval will also form a joint reaction, with the touched oval as the center of gravity, it spreads out to other ovals, and they glow in an orderly manner with

music. The innovation of this work lies in the use of "borderless" works to bring people visual enjoyment and at the same time trying to use different colors to bring people a special visual experience. Defined as a new concept of "solidified light color", the rich color changes bring a new audio-visual experience to the viewers. It is another innovation in the visual perception of new media art, and it is also the location of visual perception that brings infinite charm to new media art installations.

4.2 Units Auditory perception experience - sound effects and timbre

In new media art installations, graphics predominately accompany the sound. The primary auxiliary form of visual perception, auditory perception, can likewise be said to extend to help the audience become more fully immersed in the work. The method of presentation that most artists are most familiar with is the use of auditory perception, and practically all new media art installations employ sound to convey the mood of the work. However, not all sounds can be used effectively in this way. The things we take for granted the most are the things we overlook the most. In installation art, the grasp of sound elements is not accurate, let alone the professional level used in movies, such as the decibel value of sound, tone, timbre, device producing the sound, where the sound originates, and whether these factors have been carefully considered by the creator. It is rather common for the situation to affect the presentation effect of works of art if the sound equipment is damaged due to external factors, the audience exits, the audience overlooks the soundtrack, or the manager seems unconcerned about these "inconsequential" sounds and delays repairs. And this requires the artist to conduct in-depth research on it and find out the answer.

When the noise caused by an excessive number of visitors is discovered, "limit the current" in time and add prompt slogans to solve and maintain the works, for instance, or you can debug the sound, volume, and position of the sound that is more suitable for your own work by understanding the sound decibel tone and other information. Creating a "natural interaction" that employs meaningful auditory signals to naturally map the viewer's understanding to the audible feedback of gadgets and installations is a smart technique to deliver audible feedback. [6] In other words, the truly effective state of auditory perception should be that the audience is naturally immersed in the work, and the sound in the work has caused waves in the audience's heart, but the audience does not know it.

4.3 Equations Tactile perception experience - material and texture

Compared to sound perception, tactile perception seems to have received less attention. Most of the audience concept is still in the traditional "civilized exhibition" and "Static Viewing" state, which directly leads to the artist's neglect of tactile perception. The ability to present and ease of presentation are more important considerations for artists. The importance of the work's material and texture was reduced to secondary consideration, and the environmental protection and recycling issues were given the last say. The interactive work *Wishing Well* by artists Varvara & Mar includes tactile sensibility, which is uncommon in works that consider tactile sense. Their works use the ingenious combination of coins, water and butterfly images to encourage and present the viewer's good "wish". By dropping a coin into the wishing well, the spectator can make a wish. The butterfly picture that represents the wish will then appear in the viewer's palm before fluttering into the dancing butterfly display on the digital wall.

Its innovative method is not only in the visual feedback of the traditional wish-making method, but also because the author cleverly combines three objects of different textures and materials, the cold coins, the ripples on the water surface, and the colorful butterfly images with emotional colors in the palm of the viewer's hand together. It subtly completes the inner meaning and topic that the work's theme seeks to express by interacting with the audience and giving them a tactile and visual experience. As a result, whether it be through the choice of the material for the work or the sensation of the texture, the tactile experience is gently influencing the meaning of the work and the viewer's experience. Instead of ignoring or choosing to run away from the effect and advantages that tactile perception brings, new media art installations should pay attention to them. Art installations can extend people's audio-visual senses, realize the materialization of new media art, and make art installations accessible. [7] This should be a subject for artists to focus on, making full use of tactile perception to add great detail to their artwork.

4.4 Smell perception and taste perception experience - taste and taste

The sense of smell is not foreign. Effective olfactory design can enhance the overall sensory experience of space in multiple ways and optimize the behavior of people in the space. [8] The closest case to us is the art exhibition "Monet and Friends" held in Beijing, China in April 2022. Grand Experiences uses its own patented system - SENSORY4 to create an excellent new media exhibition for people, the exhibition The paintings of Monet and 15 Impressionist masters are displayed in digital form, breaking through the traditional flat viewing mode, and building the scenes in Monet's paintings in real, such as "Water Lily Mirror Room" and "Bridge of Lotus Pond", The Impressionist Time Corridor, etc., are called "must-visit places" by netizens. Not only that, the creator has restored the space of "Monet's living room" and "Monet's dining room", (figure2) so that people can enjoy the exhibition while watching exhibition. At the same time learn more about Monet. The water lily mirror room is the most prominent in the exhibition. The theme room is quiet and dark, and the application of mirrors and light and shadow is just right. The water lilies in the room are picturesque, beautiful, quiet, and full of color changes. The whole room is filled with the fragrance of water lilies. Immerse yourself in the world of paintings and linger. The fragrance of water lilies awakens the viewer's memory of Monet, and also leaves a special memory mark for the viewer. One day in the future, when people smell the fragrance of water lilies again, it seems that this passage about Monet will soon be recalled. Memories of Chennai Exhibition. Different smells can bring different perceptual experiences to people, and this special experience will also make people remember. It's like the coffee shop always making the aroma of coffee beans to tempt customers to "have a cup" or the milky smell of a bakery attracting you to walk in when you are hungry. Therefore, The sense of smell is closely connected with the relationship between people and design. [9] It has to be admitted that olfactory perception can not only stimulate the nervous system to move people; but also drive people's bodies to immerse in it, which can stimulate people's brain memory and enable people to have special associative memory



Fig. 2. "Water Lily Mirror Room".

If a viewer experiences a work's existence through their sense of scent, then their sense of taste provides a more immediate sensation. The application of taste sensation in art installations is uncommon. We placed candies with different flavors of sweet, sour, bitter, and spicy adjacent to our previous experimental installation "Taste," and only the tester knew the taste. To obtain immediate feedback, the viewer's face while eating sugar is captured and transferred into the expression of an animal using facial capture. Its design philosophy captures the way that people live today: "Self-knowledge of cold and warm, self-transcendence of pain and joy, all types of tastes, all are living." Integrating taste into the new media art installation is its inherent meaning. This project attempts to draw a line between people and art using the deeply held belief that "art is high above" and the perception that is closest to "human fireworks." The piece was extremely well received and stimulated a lot of interaction. Therefore, applying the perception experience of smell and taste to the field of new media art installations is still in its infancy, and requires careful design and continuous exploration by artists, only in this way can they maximize their advantages and assist art installations to achieve better results.

5 Conclusion

Even while new media art is growing in popularity, new media art installations, which are the primary manifestation and mode of existence of new media art, still have a ways to go before they reach their full potential. In addition to passing the dual tests of art and technology, artists also give their growth more attention. The presentation of the installation's spatial structure and its relationship to time should be taken into account at the early design stages, in addition to the installation's basic construction. It is important to think about how to effectively convey information through the work itself in the middle stage of design to create a strong perceptual connection between viewers and deepen the meaning of the work. The end of the design is the repeated scrutiny of the work and the reflection on the design. It is believed that after repeated deliberation, serious consideration and interactive works of art will be accepted by the public and endure for a long time. In conclusion, new media art installations need to consider both space-time construction and perceptual experience. The important way to produce good works of new media art is to fully and efficiently use perceptual experience, taking into account the meaning of the work and the viewers' perceptual needs.

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