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Exploring the emotional experience of "emptiness" in audio-visual immersive installation art --Take "Digital Wasteland" as an example

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Abstract

With the accelerated use of science and technology in the arts, the interactive experiences and emotional changes constructed in digital technology are becoming more and more abundant.In this new dynamic space-time mode, the immersive installation art uses the central integrated projection equipment, combined with split-screen projection and ground projection, to construct an "emptiness" holographic audio-visual experience space as a whole, creating a surrounding 360-degree movie effect. Perceived roles, emotions, and imagination have all changed, reinforcing time and space in continuous motion, creating an "emptiness" multidimensional experience and digital aesthetic possibilities.This research will take the art work "Digital Wasteland" as an example to understand the psychological change process of the audience's emotional experience in the experimental operation, and use the "emptiness" construction method to stimulate the audio-visual perception. actual, imagined or implied experience; Evoking the audience's emotional experience in immersive audiovisual perception: one is a contemplative distance gaze, the other is an experiential emotional imagination.In a

word, this study can help us to explain the new technology media style or immersive art theory in the way of "emptiness". By placing human beings in time, space and continuous images, it can be found that "emptiness" constructs the difference between material and immaterial, static and dynamic,But "emptiness" can be used to determine the relationship between illusory and matter, space and time.

Keywords: Emptiness, Immersion, Installation art, Experiment

1. Foreword

With the accelerated adoption of new media technologies in the 20th century, the way in which the artistic experience brought about by these technologies is defined from the perspective of the audience has changed.Today, artists and designers are participating in the dynamic iteration trend of new technologies, placing the performance of video installations in the context of multiple media, creating an immersive aesthetic experience. Based on the principle of holography, the space created by video can attract the audience to enter the scene for immersive experience. In the process of immersive experience, with the continuous movement of time and space, installation art creates static or dynamic differences of points, lines, and bodies, and the audience can experience the existence of the "empty" dimension.Within the framework of experimental exploration, by placing the audience in a state of tension and pleasure, we can perceive the cooperation between visual images and auditory imagination through on-site experience, and embody two exploratory characteristics: one is the change of distance and gaze, the other is the expansion of imagination space. The core of this immersion mechanism is the mobilization of human perception of space-time.For the audience, it is important to immerse in the completely surrounded audio-visual perception, and establish deep perceptual cooperation and understanding through immersive and participatory dynamic experience. This study will take the immersive installation art “Digital Wasteland” as an example, what researchers have found interesting is that "emptiness" is latent in actual, imagined, or implied situations. Considering the fickleness of immersive experience and its theory, when explaining the media techniques and concepts used in the work, the audience is placed in a closed space where dynamic images are gathered, and the relationship between the audience's illusion and the experience of time and space is explored.

2. Literature review

The production method of digital video combined with visual aesthetics is expressed as a hypermedia production mode, and an immersive experience space is created, reflecting the development of audiovisual art and the possibility of rationally integrating technological innovation in narrative［1］. The holographic surround audio-visual device, based on the physical condition mode of the surround video device, integrates visual visual and auditory phenomena into synesthesia, presenting two environments: one is a quadrangular space frame, and the other is a holographic projection of integrated experience［2］. Creatively explore new visualization techniques in recognizing the power of moving images and their visual techniques, as well as making their media maps［3］. The audience participatory simulation can create a new scene, which allows the audience to "sneak into" a learning environment and directly participate in the complex system, making the exploration and experiment of on-site experience possible［4］. When the audience is immersed in "reverie", the movement in and out of the internal and external environment is also a kind of perceptual movement towards "being there"［5］. Immersive virtual environments are also a new paradigm of experimental social psychology that may allow researchers to unravel the structure of interactions during the presence experience［6］. Immersive experience in the context of space and information design is pushing code and application design to a new limit with the development of art project creation and experience, which predicts possible technological development in data visualization and virtual space construction［7］. The ability to conceptualize forces of nature is incorporated into the work, bringing together disparate cultural and intellectual domains, with signals as the central node of dematerialization, technologies that make up the field of digital media and post-humanist controversy, using the intangible and immaterial as metaphysics converter［8］. Without linking the basic operation of the installation to the lack of technology, the decisive role of the coordination configuration for a particular audience pattern is largely unrecognized［9］. Through the theory that media technology affects artistic style, we can interpret the unpredictable illusion as the classification of various expressions［10］. Based on the importance of embodying the understanding of visualization in scientific and technological research, placing visualization technology in the context of the overall organization of the installation will help us understand the artistic concepts expressed in immersive experiences［11］. To sum up, the researchers found that the use of new technology can better build immersive installation art and discover the possibility of relevant interactive

experience, but the focus on "empty" emotional experience is rarely mentioned, which provides an opportunity for this study［12］.

3. Methods

Because the boundary between the phenomenon of "emptiness" and the actual immersive artistic conception is ambiguous, and its variables cannot be accurately, directly and systematically understood, this study will try to take the installation art Digital Wasteland as a case to collect relevant information to discuss the situation of immersive audio-visual perception phenomenon in the process of audience participation and experience. Based on the data from the creator and the analysis of relevant literature in the field, researchers can have an in-depth understanding of the immersive scene construction in the experiment and practice process of the work. Based on the data from the creator and the analysis of literature in related fields, researchers can gain a deeper understanding of the immersive scene creation of the work in the process of experimentation and practice: observe and explore the behavior of on-site audiences, the changes in the scale of "empty" and its unique characteristics logic. This study takes the qualitative nature of "emptiness" as the question direction and the focus of data analysis, discusses the theory of immersive problem definition, construction and development of technological media scale, discovers the integrity of audience involvement and emotional experience, and focuses on exploring the meaning characteristics of "emptiness". In a word, the descriptive study and systematic understanding of this case can reveal the audience's immersive experience and the situation in the process of mutual participation, so as to obtain a holistic view of the emotional experience in immersive installation art.

4. Research content

Digital Wasteland is a work with the theme of discussing the contradiction between human irrational development activities and the natural environment. In terms of the specific content of the work, the creator, based on the research and thinking of real events, conceived a story that people were forced to move their living space from the earth in an emergency as the environment was destroyed and resources were exhausted. With the support of powerful science and technology, the future human beings will march towards the vast interstellar space,

However, they even abandoned a large number of people on the dying earth. The works are presented in the form of real-time interactive digital images and physical devices, so that the audience can become a data repairer and experience a future human experience in an immersive atmosphere.

This work is a holographic image installation art designed by a cooperative team of young artists, sound designers, programmers and video application development companies. It aims to investigate the relationship between sound and image perception in a square enclosed space, and construct a surrounding virtual environment by taking the square environment as the framework of the relationship between sound, vision and physical space. Combined with virtual reality, the audience is placed in an immersive virtual environment, and the audience is encouraged to perceive the enclosed space and its content, and the sensory experience is defined as a synthetic perceptual information. Through this immersive experiment, it is possible to explore the mental state in the environment, in which the individual believes that he is surrounded by an environment with a continuous flow of stimuli, and can even perceive an emotional experience of "empty".

4.1 Immersive construction

With the image of the closed cubic space as the main body, the naked 3D large screen technology is used to immerse the audience in the immersive feeling. However, the construction of hardware and software required by this technology will greatly limit the viewing angle of the audience. According to the existing technical conditions and hardware facilities, the creative team has a more unique design on the experience of immersive installation art: it has obtained the hardware and technical support of Hangzhou Yiyu Qianxiang Technology Co., Ltd. (Figure 1) , and adopted the naked eye hybrid virtual and real space nSpace technology, The whole picture is projected on the front, back, left, right and bottom five surfaces of the cube space, and the angle of different pictures is calculated based on the position of the audience. Combined with the effect of the Kinect camera design, the Kinect camera's body sense recognition technology is used to update the vertex offset of the scene model thro ugh the stagger matrix transformation based on the point position of the audience's face, and make up the difference between the viewing angle of the audience and the screen in real time, Let the image present a feeling similar to "naked 3D", breaking the perception The characteristics of traditional screen images, and the audience will feel that there is an unlimited digital space behind the screen. In a word, the work creates an immersive

video installation art as a whole, further enhancing the immersion and realism of "emptiness".

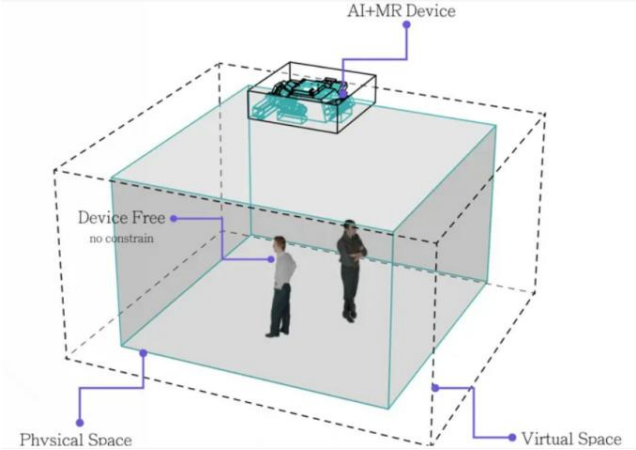

Figure 1. Construction of naked eye mixed reality space（Picture quoted from：http://www.archifiction-inc.com/cn/about_cn.html）

Figure 2. Digital Wasteland Digital Point Cloud Construction and its effect test in nSpace (image provided by the creative team)

4.2 Interactivity of the audience

In terms of interactive design of image installation art, the final image presentation mode of Digital Wasteland is based on the real space technology of nSpace naked eye mixture. In order to distinguish traditional operations such as keyboard and mouse, clicking and moving the handle, the creation team has designed a breakthrough interactive mode, that is, it can "repair data" in the interaction process. The audience needs to explore the scene in certain difficulties and obstacles, and repair the damaged and blurred particles or real objects in the scene. In addition, the interaction in the work is in line with the characteristics of mixed reality, which makes the audience feel as if the screen "disappears" between the digital images, and the relationship between the blurred particles or objects and the scene entity. When the audience

uses flashlight light to illuminate the image, the device will send a light to the image scene to illuminate the objects in the virtual space. The audience can also freely control the angle and direction of light, so as to gradually explore the profound space in the dark scene (Figure 3). This interaction mode breaks the distance limit of the screen and meets the requirements of immersive perceptual experience of "empty" mixed reality.

Through the on-site experience, it calls for technology and art to provide a kind of reconciliation between nature, spirit, body and culture. When the audience is completely immersed in the experience process of installation art, it returns to the dual movements of infiltrating internalized contraction and ethereal outward expansion in this way, and the audience will show a state of excitement or panic because of the virtual lag: The first focuses on going beyond virtual or immersive environments; The second imagines that artificial life and "digital existence" coexist. The body of the viewer in the face of arbitrary signals is key here, and some signals attempt to replace the body as the new relevance, while embedding the digital in the transformed "reality", privileging human beings over technological agents, forcing a shift in the dimensions of human cognition. In terms of the design of the device, the creative team referred to a large number of design elements in science fiction films and made corresponding design for the interactive lighting device after imagination (Figure 4). Then, the interactive lighting device was further improved according to the characteristics of the audience, image and space, so that the image presentation and interactive experience have a better coordination, and the integrity of the work narrative has been enhanced.

Figure 3. Interactive effect demonstration of "Flashlight Illumination" (picture provided by the creative team)

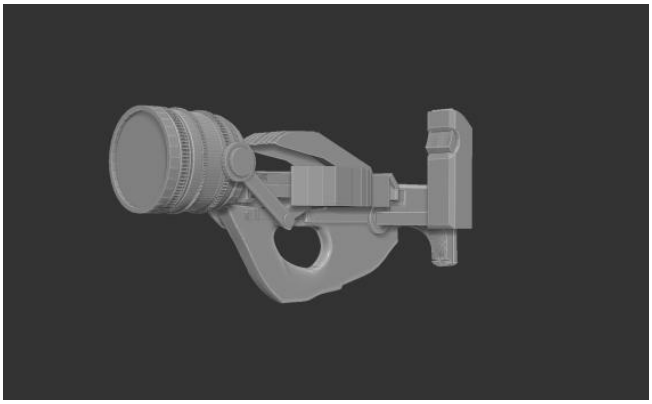

Figure 4. Iterative design renderings of the hand-held light installation (image provided by the creative team)

4.3 Narratives that simulate real objects

Through the concept of metaphor and resonance of space, the relationship between human and space perception becomes more complicated. The key point of this relationship is that as information, it needs a technical intermediary form to be perceived. In this system, because it provides a surface surrounded by media, a body permeated by technology. The creative team of Digital Wasteland encountered many difficulties in the process of production, so they still searched for data to study "modeling of virtual plants in experiments" (Figure 5); Virtual life is different from real life in many ways. In the confusion of virtual life, they are most interested in the confusion of cognitive methods.

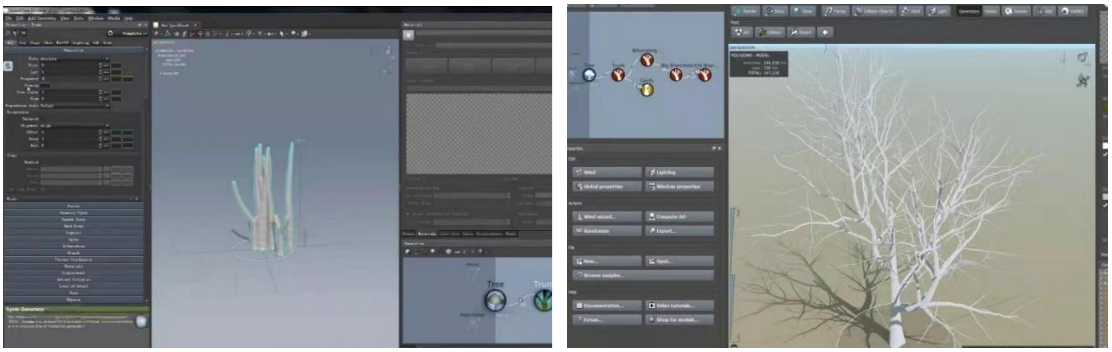

Figure 5. Virtual simulation of real nature (picture provided by the creation team)

In the design of auxiliary narrative media, the creators have adopted a large number of narrative methods to guide the audience into the fictional world. When the audience enters the immersive device, they will interpret the world view independently and guide the audience into the next emotional experience process. However, as the narrative progresses, the narration will also gradually reveal itself, inducing personal views and imagination of the

future world, or deepening the narrative content in a contradictory and impact way, which can also further enhance the audience's experience and feelings. When further discussing the data visualization method in immersive devices and its role in experience, researchers found that the heartfelt emotion and attractive virtualization become more and more intuitive. The audience's "experience" often depends on the fictional space in the internal psychology, which essentially reflects the imagination and symbolism of "emptiness" in the immersive environment.

5. Experimental analysis

5.1 Go beyond visual perception

Digital Wilderness combines the style of realism and digitalization: one is the relevant model data of real scenes and object modeling obtained through scanning and photographic modeling; The other is to design 3D models according to the needs of the scene. By using VFX particle effects in Unity and Shader programming to achieve unique visual language effects based on reality and beyond reality, the static model is processed with dynamic effects, and the virtual sense of visual effects is enhanced. Shader further strengthens the integration of the overall elements of the scene. Through experiments and practices, visual perception is investigated to explore the relationship between audience and space as an important part of image execution. When the viewer enters the realm of virtual reality, identity is assumed to be fluid and variable, reminding the viewer to experience something completely new in the space and time of virtual reality. The viewer places their body in the scene, and through exposure to this new technology of point clouds, and immersed in the white and quivering image space, may inspire a surprising array of perceptions. This kind of live experience will go beyond audio-visual perception, and will feel the contradiction between the unreality of digital image and its high degree of restoration of reality, so as to achieve a strong "empty" experience effect.

5.2 Experiencing the Empty Problem

As the boundary between the real and the virtual, there exists an ambiguous "void", which is unexpectedly affected by emerging technologies. The new software will integrate more and more game elements and data informatization, so that the audience will be fully engaged in

the "empty" experience. When the audience enters the space center of Digital Wasteland, interactive activities such as lighting up the environment or moving to the scene can enhance the immersion of the experience. In the space where visual or sound media are gathered at the same time, the audience can be summoned to concentrate more, and try to link the virtual and real spatial relationships, so that the visual video images and intangible sound language in the immersive device can be organized into a real-time interaction mode, creating a constantly changing force field, thus inferring the "empty" invisible environment. If this "emptiness" is a kind of environment or atmosphere, it is a kind of space attribute that the audience is familiar with. Experience in contact situation, real space and virtual space between spiritual experience is extremely significant difference between the two: on the visual, auditory atmosphere, can stimulate the material and spiritual awareness, and the visualization of the object with the imagination of intangible and put in audio-visual environment atmosphere, can stimulate the transcendence of the "empty" more the spirit of consciousness. If this "emptiness" is a kind of environment or atmosphere, it is a kind of space attribute that the audience is familiar with. Experience in contact situation, real space and virtual space between spiritual experience is extremely significant difference between the two: on the visual, auditory atmosphere, can stimulate the material and spiritual awareness, and the visualization of the object with the imagination of intangible and put in audio-visual environment atmosphere, can stimulate the transcendence of the "empty" more the spirit of consciousness. As a kind of mental thinking, "emptiness" itself has the experience of attracting and repelling the audience. It can be seen that the perception of visual images in material images will show the characteristics of oscillation or flow, and will regulate the relationship between spatial stillness and dynamic balance.

6. **Conclusion**

Immersive installation art that integrates hardware and software systems includes the construction of technologies such as multimedia software, databases, computers, presentation engines and user interfaces.This integrated system creates spatial coordinates, determines the audience's position and orientation in real and virtual spaces, and perceives changes in spatiotemporal information through coordinates, while inducing emotional imagination. Therefore, in terms of visual information, although virtual content in different directions with the viewer as the coordinate is different, they collectively surround the immersive situation. In Digital Wasteland, when the audience's eyes move to the left or right, forward or backward,

and look down, they may feel inclined and inverted. When the audience is immersed in an immersive atmosphere, controlled by various factors in the scene, forming an unstoppable mixture, "emptiness" determines the emotional flow of immersion. With the integration of various new media technologies, space and flesh are linked into the relationship of transcending space-time experience itself, creating a pleasant, exciting and even spectacular experience process. "Space" initially presented a movie-like audio-visual effect, but with the movement of the audience, the flow of visual perception erupted, showing a unique space-time artistic conception and logic through interactive experience aesthetics.

References

[1] Lorrie Palmer, "Cranked" Masculinity: Hypermediation in Digital Action Cinema, Cinema Journal, Vol. 51, No. 4 (Summer 2012), pp. 1-25.

[2] Oliver Gingrich, Alain Renaud and Eugenia Emets, KIMA — A Holographic Telepresence Environment Based on Cymatic Principles, Leonardo , 2013, Vol. 46, No. 4, LEONARDO SPECIAL ISSUE: SIGGRAPH 2013 Art Papers and XYZN: ScaleArt Gallery (2013), pp. 332-343.

[3] Nanna Verhoeff, Surface Explorations: 3D Moving Images as Cartographies of Time, Published by: Amsterdam University Press. (2020), https://www.jstor.org/stable/j.ctv12pnt9c.11.

[4] Vanessa Colella, Participatory Simulations: Building Collaborative Understanding through Immersive Dynamic Modeling, The Journal of the Learning Sciences , 2000, Vol. 9, No. 4 (2000), pp. 471-500.

[5] Frances Dyson, Immersion, Sounding New Media--Immersion and Embodiment in the Arts and Culture , University of California Press, https://www.jstor.org/stable/10.1525/j.ctt1pn6r1.10.

[6] Jim Blascovich, Jack Loomis, Andrew C. Beall, Kimberly R. Swinth, Crystal Hoyt and Jeremy N. Bailenson，Immersive Virtual Environment Technology as a Methodological Tool for Social Psychology, Psychological Inquiry , 2002, Vol. 13, No. 2 (2002), pp. 103-124.

[7] Richard K. Merritt, From Memory Arts to the New Code Paradigm: The Artist as Engineer of Virtual Information Space and Virtual Experience, Leonardo, Vol. 34, No. 5, Ninth New York Digital Salon (2001), pp. 403-408.

[8] Frances Dyson, Atmospheres, Sounding New Media, Immersion and Embodiment in the Arts and Culture, University of California Press, https://www.jstor.org/stable/10.1525/j.ctt1pn6r1.12.

[9] NOAM M. ELCOTT, The Phantasmagoric "Dispositif": An Assembly of Bodies and Images in Real Time and Space, Grey Room, No. 62 (Winter 2016), pp. 42-7.

[10] Noam M. Elcott, The Phantasmagoric Dispositif: An Assembly of Bodies and Images in Real Time and Space Chapter, Amsterdam University Press. (2020), https://www.jstor.org/stable/j.ctv12pnt9c.15.

[11] Janet Vertesi, Seeing like a Rover: Visualization, embodiment, and interaction on the Mars Exploration Rover Mission, Social Studies of Science , June 2012, Vol. 42, No. 3 (June 2012), pp. 393-414.