DIGITAL REALIZATION OF TRADITIONAL RESIDENTIAL HOUSES IN FUJIAN: APPLICATION AND RESEARCH ON IMMERSIVE SCENES IN VIRTUAL ANIMATION DESIGN

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ABSTRACT

This paper specifically takes Fujian traditional dwellings as a research case, trying to explore the application of immersive scene design in animation design. This paper selects Fujian traditional dwellings as a specific research case, studies the combination of architectural elements of Fujian traditional dwellings and animation scene design, and provides practical theoretical support for the development of animation scene production in China. From the perspective of animation design, the integration of traditional residential buildings and new digital media technologies, and the integration of traditional Chinese cultural symbols into animation works can allow the audience to obtain the most direct visual impact in the immersion, so as to achieve An immersive experience.

This study delves into the traditional dwellings of Fujian, using them as a backdrop to investigate the potential of immersive scene design in animation. By analyzing the architectural nuances of Fujian's historic residences and their application in animation, the research offers pivotal insights for China's evolving animation scene production. The central premise revolves around the synergy between age-old residential architecture and modern digital media technologies. Furthermore, the research underscores the significance of embedding traditional Chinese cultural symbols within animation. This fusion not only enhances the visual appeal but also ensures that audiences are treated to an immersive and deeply resonant viewing experience.

Keywords: Virtual reality, Digitization, Animation

INTRODUCTION

Digital media technology refers to the use of computer analogs to produce a three-dimensional virtual world, providing users with sensory analogies such as vision, hearing, and touch, allowing users to feel as if they are immersed in the scene, and can interact in real time and Observe things in three-dimensional space without limitations. When the user moves his position, the computer can immediately perform complex calculations and transmit accurate three-dimensional world images back to create a sense of presence.

3D animation scene, 3D is three-dimensional imaging technology. Scene mainly refers to a certain task action or life picture that occurs in a specific time and space, which is often used in the field of animation (Wang Yumei, 2017). That is to say, the production of animation scenes that can give us a three-dimensional visual experience. Generally, there are two main application scenarios. One is film and television works, which mainly designs specific plots and character storylines, etc. The other main usage scenario is reality. Situation simulation mainly serves technical environments such as medical care, construction, and industrial production.

This paper specifically takes Fujian traditional houses as a research case and attempts to explore the application of immersive scene design in animation design. This article selects traditional folk houses in Fujian as a specific research case, because Fujian is located on the southeast coast of my country and is a "southeast mountainous country" with "eight mountains, one water and one cent". Due to the differences in geographical environment, folk houses with different styles have been formed. Form (Tan Kangsheng, 2008). Fujian buildings have long been listed as world cultural heritage and are famous all over the world. In addition, there are also various types of residential buildings. Traditional houses are precious material architectural heritage, and the protection of ancient buildings and ancient culture is also an important contemporary issue. From the perspective of animation design, integrating traditional residential architecture with new digital media technologies, and integrating traditional Chinese cultural symbols into animation works can allow the audience to gain the most direct visual experience while immersing themselves in China. The traditional culture is extensive and profound. How the architectural modeling elements in traditional Chinese culture can be combined with digital media in the new era to give them new vitality and vitality is an important goal of design research.

In scene design, immersive scenes are a new concept that has emerged in recent years. In China, immersive scene design has gradually emerged since 2010 and attracted public attention. The industry has strong prospects and huge market potential, but it has not yet formed a complete industrial system and has important research value (Gao Yu, 2012). "Residences", in a broad sense, include residences, ancestral halls, temples, public buildings and other buildings built by people to meet their daily needs. In a narrow sense, it refers to buildings used by people to live in. In Professor Lu Yuan's explanation, "traditional folk houses" are "people who, in their struggle with the natural environment, have gathered the countless wisdom and experience of their ancestors to create houses that meet the needs of human life and production." Various types of buildings." The research object of this article is mainly residential buildings in traditional Fujian houses (Wu Zhendong, 2008).

This paper studies the combination of architectural elements of traditional Chinese culture and animation scene design, providing practical theoretical support for the development of animation scene production in China. Traditional Fujian houses are the product of the harmonious coexistence between local people and the environment. They have strong humanistic attributes and can show the character of the local people and their environment, thereby exploring the cultural meaning behind them. Applying it to animation scene design can promote the development and prosperity of the cultural industry. Correspondingly, it is also a new idea and method for protecting traditional residential buildings. At present, domestic research on animation is still in its infancy, and there is even less research on animation scene design. This paper takes the immersive scene as the starting point, which is conducive to the

combination of animation design and the development of digital technology. Therefore, it has important practical significance.

The emergence of digital media and its integration into various fields has brought about significant transformations. In the field of digital media architecture, especially architectural modeling, new methods of design and representation are introduced. However, the application of these methods in the preservation of traditional architecture remains unexplored. This raises a research question: how to effectively apply architectural modeling and immersive scenes in digital media technology to the protection of traditional buildings. This research question can be further decomposed into the following sub-questions: 1. Understanding immersive scenes: Although there is a growing interest in immersive scenes in architectural modeling, there is still a lack of comprehensive understanding of this concept. How to achieve immersion in architectural modeling. Understand what the key elements and principles of immersive scenes are. 2. Integration of digital media and traditional architecture: Although digital media has been integrated into modern architectural design, its application in traditional architecture is not yet known. How can digital media technologies such as architectural modeling and immersive scenes be effectively integrated into traditional architecture. How to effectively integrate digital media technologies such as architectural modeling and immersive scenes into traditional architecture. 3. Case Study of Fujian Traditional Folk Houses: Fujian traditional folk houses are a kind of cultural heritage that need to be inherited and protected. However, the application of digital media in protecting these dwellings is unclear. How to apply architectural modeling and immersive scenes to the protection of traditional houses in Fujian. 4. Impact on cultural protection: The impact of digital media on cultural protection is a complex issue that requires further exploration. How the application of architectural modeling and immersive scenes can contribute to the preservation and promotion of traditional architecture. Therefore, this research aims to understand and analyze the principles and elements of immersive scenes in architectural modeling.

LITERATURE REVIEWS

Research on immersive scene design began in the 1980s, and sporadic research began in China at the beginning of the 21st century. The number of related papers has increased significantly since 2017. The research on immersive scenes is still in its infancy, and the research on the combination of residential buildings and animation design is almost empty, and is mainly concentrated in animation design and other fields. Therefore, although the research has started, there are still obvious problems. Not enough.

There are a total of 41 Chinese documents on immersive design related to the topic of the paper (themes are overlapping), of which 29 are on the topic of "virtual reality", 28 on "space design (mostly museums)", and 11 on "exhibition design" There are 11 articles on "Digital Media Art", such as "Research on the Application of Digital Art in Museum Exhibition Display", which constructs digital art in museum display design by sorting out the relationship between digital art and museum display art. We use this theoretical system to redefine the form and content of exhibitions, establish a digital art application system for museum exhibitions, and present a museum space exhibition effect that combines technology and art. Jin, 2017). Another example is "New Trends in Visual Art Education: Research on New Media Art Curriculum and Teaching in Middle Schools under the Background of the Digital Era", which is a new attempt and new method to combine new media with middle school education to promote the development of school art education in the digital era. . It can be seen that there are very few documents directly titled immersive design and belonging to the field of art and design, while there are many discussions on immersive theater and immersive space design.

In terms of cultural creativity, the combination of immersive scenes and Chinese culture, and the digital inheritance and dissemination of national material cultural heritage are the focus of

researchers on the development of traditional culture. In 2011, the National Library launched the "Memory of China" project, "which includes attempts to use new media means to reproduce and disseminate intangible cultural heritage such as Chinese New Year paintings and silk weaving and embroidery." 2009 Peng Yi discussed that "Digitalization and multimedia technology are the best ways to preserve intangible cultural heritage archives." In 2013, "H. Thwaites thinks from the perspective of information, cultural transformation, multi-layer transmission, and human values. It understands the changes brought about by the digitization of cultural heritage." In "Digital Protection and Dissemination of Intangible Cultural Heritage under Information Space Theory" by Tan Guoxin and others, from the three dimensions of encoding, abstraction and diffusion of information space theory Analyzed the digital form and characteristics of intangible cultural heritage, and proposed preliminary solutions from the perspective of information theory (Tan Guoxin, Sun Chuanming, 2013). This is an earlier attempt to protect traditional culture from the perspective of information space. Therefore, the attempt to use 3D technology to protect traditional culture is no longer a new technology, but an inevitable requirement of the new era. The 2016 Stanford University "Digital Angelo Project", the "Virtual Forbidden City" project jointly developed by the Palace Museum and IBM, and the "Silk Road" cultural resource service platform are all good examples. The support of digital technology remains the main driving force for the development of traditional culture and the spread of digital art. Virtual technology allows users to have the opportunity to see and experience the charm of ancient culture and the cultural value behind it at close range, giving endangered cultural treasures new vitality.

In recent years, research on Fujian folk houses has also achieved great results. In addition to the original architectural history itself, it attempts to explore the new situation of inheritance and protection of traditional folk houses in combination with the new era and new conditions. We cannot just start from the purely material level, we also need to start from the spiritual level and come up with new plans. Zhang Zhi's "Application of Chinese Traditional Residential Architecture in Animation Scenes - Taking Fujian Earth Buildings and "Big Fish and Begonia" as Examples" is a new idea to explore the integration of traditional residential architecture and modern animation scenes (Zhang Xiangzhi, 2020). Zhang Wenqi's "Application of Traditional Chinese Architectural Elements in Animation Scenes" also elaborates on the combination of some traditional Chinese architectural elements and animation scenes (Zhang Wenqi, 2017).

RESEARCH METHODOLOGY

In this study, theoretical research will be conducted through academic monographs, journal papers, atlases, and other relevant literature research; Obtain basic data through on-site research methods such as surveying and mapping, questionnaires, and statistics; Conduct design practice research through case analysis, interview methods, and other methods. This research takes the Earthen Building in Fujian Province building as the main research object, and adopts three research and analysis methods of qualitative analysis, quantitative analysis and comprehensive analysis to summarize and analyze the relevant collected data. The specific research methods of this article include: literature research method, participatory observation method, surveying and mapping method, questionnaire survey method, interview method, and case analysis method.

Figure 1 Yongding Tulou, Fujian
Source: China News Network, provided by the Propaganda Department of Yongding District Committee (2022)

RESEARCH RESULTS

Regarding the integration of virtual reality technology in 3D animation scenes in the digital media environment, the researchers obtained field survey data through surveys, interviews, visits, practical application production, group discussions, etc., based on the research objectives. Use theory to analyze and summarize actual cases and data. The analysis results are as follows: There is a certain consensus in the industry that digital media technology and the construction of 3D animation scenes have commonalities. The core of virtual reality is to build a virtual environment and reproduce the three-dimensional perception in the real world as realistically as possible. Under this demand, the realization of various functions of virtual reality technology and 3D animation all rely on the generation of two-dimensional images in the two-dimensional flat world or the calculation of 3D images, all relying on 3D modeling technology (Zhou Lulu, 2021). In the actual integration and application process of virtual reality technology and 3D animation technology, the mutual characteristics between the two have led to adaptive development in scenes, characters and some specific fields. In the mid-21st century, 3D modeling based on two-dimensional images is still a relatively economical, flexible and widely used method. The key point is to create a three-dimensional model after establishing key control points from the two-dimensional image. Virtual reality technology enhances the visual sense of space through 3D animated scenes, while virtual reality technology brings visual authenticity to the design and production of 3D animated scenes. The effective integration between the two also brings visual experience and more The possibility of the development of multi-tech application scenarios.
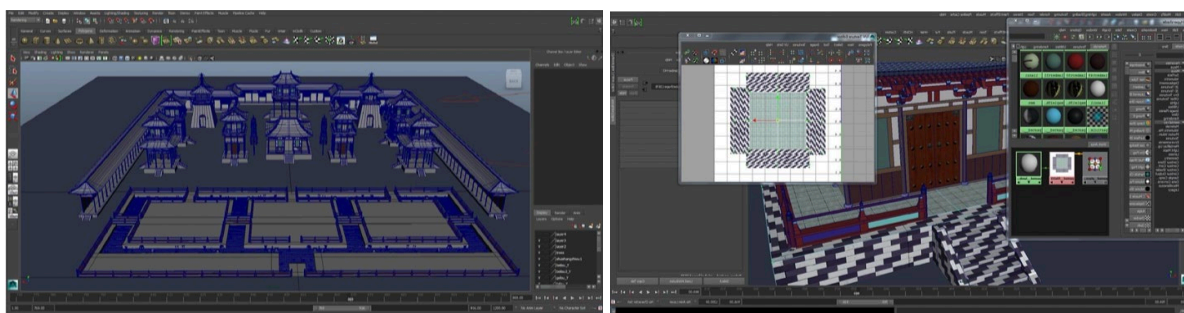

Figure 2 3D Model of the Building
Source: Author

CONCLUSION & DISCUSSION

Conclusion

In the process of computer program processing and generation of virtual screens and images, virtual reality technology can provide more ideas for the creation of 3D animated scenes. The

two complement each other to a certain extent. Virtual reality technology was born under the increasing visual requirements of 3D animation scene design, mainly to satisfy people's desire to explore and interact with virtual three-dimensional space. Some people in the industry believe that virtual reality technology is an extension and expansion of 3D animation visual expression methods (Deng Qiang, 2019).

In the investigation and research, a more important discovery is that the integration and application of virtual reality technology and 3D comic scenes has brought some never-before-discovered aspects to visual realization. The changes that have occurred, which to a certain extent deserve the attention of practitioners, are mainly as follows:

The scene design is more realistic

Virtual reality technology can truly restore and reflect the dynamic perspective in the scene, and effectively capture the 3D information required for scene modeling, which cannot be realized by traditional computer technology. On the basis of virtual reality technology, with the help of 3D animation Software to capture comprehensive animation information, use computer software to process the required 3D animation scene data reasonably, and transmit it through the new media environment, so as to obtain detailed information about the 3D animation scene information. It also shows more authenticity in mastering the actions in the scene and the lens processing of interacting with the scene. In the process of using virtual reality technology to implement 3D animation scene design, strengthen the understanding of various technologies and 3D animation imitation, and apply effective 3D animation creation methods to make the designed visual display more smooth and flexible. At the same time, when using virtual reality technology to create 3D scenes, real-time scene data collection can also be realized, and these data can be applied to achieve data adjustment and reasonable adjustment of 3D animation data, so as to improve the accuracy and data density of data technology modeling is improved, thereby improving the accuracy of the scene.

Diversification of scene angles

After the virtual reality technology is involved in the creation of 3D animation, it brings more expressive power to the whole scene and the story served by the scene, and mobilizes various senses of the human body to receive images and information. The 3D animation scene based on virtual reality technology can directly bring the audience into the work, making the audience a part of the scene and gaining an immersive feeling.

Scene continuity shot added

The virtual space constructed by virtual reality technology can more effectively capture the three-dimensional information required in scene construction, integrate and process the required 3D animation data, and obtain data on the further construction of 3D animation scenes resource. 2 Virtual reality technology can help the 3D animation scene design to better integrate various elements. By integrating elements, a new pattern can be constructed. The products that come out are visually closer to our lives, so that users can be more comfortable. A better understanding of the scene, a more realistic scene from the displayed angle is more conducive to the coherence and presentation of the lens, and it can also allow the audience to better observe the change of position and angle under virtual reality technology.

Enhanced spatial narrative ability

The creation and expression of time and space has always been the foothold of animation creation creativity, and it has always been the core element of animation creators when conceiving and expressing. The transfer from time narrative to space narrative is also an obvious phenomenon of the introduction of virtual reality technology into 3D animation scene production. The previous scenes were more for the service of time narrative, laid out around the unfolding of the plot, and the intervention of virtual reality technology makes space narrative possible. Under the creation of a specific scene, viewers can explore the scenes in the scene with curiosity. Explore the breadth and depth of the scene, and some plots can even be

gradually unfolded in the sense of space built around a certain scene. It is easier to incorporate a sense of time in 3D animation scenes based on virtual reality technology, because with the space exploration of the first perspective, time naturally advances forward, using space to express time and weakening time expression, so that space It becomes possible for the narrative to become the main line.

Enhanced immersion

The great improvement that virtual reality technology brings to the creation of 3D animation scenes lies in the creation of a stronger sense of immersion in the scenes. New perspectives for many scenes have also been added. At any time and in any environment, the viewer can look around, and this sense of participation also makes the viewer think more. The increasing maturity and wide application of virtual reality technology provides a new perspective and means of expression for 3D animation scenes and wider creation. The characteristics of virtual reality technology itself determine that it has unlimited creativity and possibilities. The flexibility of computer computing also subverts the limitations of traditional 3D animation creation. Traditional 3D animation fully demonstrates the potential of artistic creation through virtual reality technology. Connotation and charm. Virtual reality technology makes the scene creation of traditional 3D animation more interactive and immersive. In the future, the wider combination of virtual reality technology and 3D animation creation will further expand the creative space of traditional 3D animation, and will further promote the perfection of traditional 3D animation creation, and finally realize inheritance and innovation.

In November 2022, five departments including the Ministry of Industry and Information Technology, the Ministry of Education, the Ministry of Culture and Tourism, the State Administration of Radio and Television, and the State Sports General Administration jointly released the "Virtual Reality and Industry Application Integration Development Action Plan (2022 -2026)" mentioned the need to accelerate the implementation of applications in multiple industries and scenarios. It is necessary to develop towards the development goal of large-scale and specialized integrated applications, and deepen the integration of virtual reality and industry organically in many fields such as industrial production, cultural tourism, integrated media, education and training, sports and health, and business creativity. Fusion.

With the continuous development of virtual reality technology, virtual reality technology has gradually been widely used and promoted in various fields of society. The application of virtual reality technology in the field of 3D animation scene production has important innovative significance. In terms of technological development, the better integration and application of virtual reality technology and 3D animation technology can comprehensively improve the creative breadth and efficiency of 3D animation scene production, and promote the overall development of the animation industry.

Discussion

First, under the background of the development of digital technology, animation art has made new developments. The application of immersive scenes has made animation creation very different from the past, resulting in many characteristics, such as creative methods, In terms of aesthetic changes, communication characteristics, etc., the ways in which immersive scenes create a sense of immersion still require in-depth interpretation.

Secondly, regarding the application of Fujian traditional folk houses, past research on this subject mostly focused on the inheritance of world heritage, but there was less cultural and spiritual interpretation of its connotation, which can be linked to animation creation. place. It can be seen from the existing research that there are few studies on China's excellent traditional culture, a lack of interpretation of the spirit of cultural communication, and a lack of high-quality artistic means to recreate and inherit art, which is not the case. Conducive to cultural self-confidence. New ways and methods to link traditional culture and animation creation still need to be found in order to achieve the goals of cultural dissemination and cultural innovation.

Third, traditional folk houses are special products of a specific place and must require local context to restore their authenticity. Conflicts in context and obstacles to understanding will cause difficulties in understanding and inheritance. Therefore, studying the application of immersive scenes in animation creation requires on-site inspections in order to understand the cultural identity of the group and enter local cultural practices.

The integrated application of virtual reality technology and 3D animation scenes not only improves the experience of existing professional fields, but is also likely to open up new needs and satisfy new markets. In each of the currently known major application scenarios, we can see a growing number of market users and a certain revenue scale. But in the process, we also deeply felt the challenges that may come from technology and humanities, as well as the development of the technology behind them.

Behind this is the market development jointly promoted by consumers, experiencers, market practitioners and equipment manufacturers. When examining various major development fields, we can see that only the three major fields of video games, live film and television, and entertainment are driven by consumers, accounting for about half of the overall industry revenue. The remaining part depends more on Development strategies and decision-making orientation of enterprises and public sectors.

In addition, as virtual reality technology matures and expands, we can see that the technology itself is also facing certain development bottlenecks, mainly in display technology, real-time processing, and calibration and restoration of the physical world environment. The combination of some virtual reality technologies and application fields is still far away from industrialization development. Virtual reality technology occupies a large area in the fields of video, games and entertainment. It is currently in a state of relying on content production, but the dissemination of this content also relies heavily on the devices that can currently experience virtual reality. quantity. If the number of users with virtual reality wearable devices on the market is small, developers and creators will also have a cautious and conservative attitude towards content creation and technological inovation.

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