Research on Immersive Art design Experience based on VR Technology

Zhengyao Zou

NO.1 Hight school the experimental school affiliated with Zhuhai, Zhuhai, China

3488759493@qq.com

Abstract. The rapid advancement of virtual reality (VR) technology has sparked enthusiastic exploration by artists and designers in the field of art and design. This integration not only expands the possibilities of artistic expression but also provides an immersive experience for audiences. It is expected to reshape the art and design landscape, enabling artists and designers to push boundaries and create truly transformative experiences for viewers. The main objective of this study is to deeply investigate the immersive art design facilitated by VR technology and explore its potential for innovation in art and its impact on viewers. This paper analyzes VR technology, discussing the differences between VR art and traditional art, and explores innovative VR techniques. Furthermore, this paper summarizes the influence of VR technology on artistic experiences. Lastly, a concluding remark and future perspectives are provided. To summarize, the rapid evolution of VR technology presents immense potential for revolutionizing the fields of art and design.

Keywords: Immersive art, design experience, VR technology.

1. Introduction

With the rapid development of technology, VR technology has become a powerful tool in the field of innovative art. Artists use VR technology to create paintings in a 3D environment, and the audience can be fully immersed in a self-centered visual experience. By changing the viewing Angle or distance, the viewer can discover the multi-faceted nature of the painting [1].

VR technology is not only limited to artistic creation, but also can bring a broader experience to the audience. Through VR glasses, viewers can experience the scenery of foreign countries in an immersive way, avoiding the tedious procedures of applying for visas, purchasing air tickets and preparing cash. This technology allows people to go anywhere they want from their own home. Immersive VR technology can not only carry out free and three-dimensional communication and interaction with others anytime and anywhere, but also save time and cost, bringing convenience and speed to people [2]. Although the promotion and application of VR technology has yet to be fully developed, its potential is unlimited. With the progress of The Times and technology, there will no longer be anything unreachable in the world of VR.

By delving into immersive art design experiences based on VR technology, we were able to explore its innovative potential in the art world and its impact on the audience. This fusion of technology and art provides artists, designers and audiences with a richer and deeper artistic experience. Our research aims to understand this convergence and explore innovative ways of artistic expression. With the rapid development of VR technology, more and more artists and designers began to explore the application of immersive technology in the field of art design. This convergence trend not only broadens the forms of artistic expression, but also brings new artistic experiences to the audience.

2. VR Technology

VR, translated as virtual reality technology. It refers to the use of computer modeling simulation scenes and sound effects to create a simulation simulation environment, so that users can get an immersive experience. Technicians record objects in 3D form through software synthesis or panoramic cameras, and output them with VR glasses, so that the audience can see three-dimensional

images. These images are not directly seen by us, but are simulated by computers and we cannot touch them.

Table 1 A Contrastive Analysis of Traditional Art and Immersive Art

	Viewing Mode	Interactivity Limitation	Controllability	Audience Group
Traditional Art	Watch live	Behind protective glass	There is no control	The majority are middle-aged and elderly
Immersive Art	Look through the VR glasses in all directions	You can get a deeper understanding of the artwork	Strong controllability	More popular with teenagers

The limitation of traditional art viewing mode is that the audience can only feel the beauty and meaning of the work through on-site viewing. The viewer is restricted by the protective glass and cannot get in-depth information about the artwork. In addition, traditional art works lack interactivity, and audiences are unable to interact and participate substantively. Viewing traditional art often requires travel to relevant exhibition locations, and problems with transportation and exhibition have added to managers' frustrations (Table 1).

Immersive art changes viewing patterns by introducing VR technology. Through the glasses, the audience can see the works in all directions, regardless of location. They can gain a deeper understanding of the artwork's information and are able to connect substantively with the work through interaction. Immersive art has a high degree of controllability, and the audience can move and interact freely, so as to deeply experience the art work. In addition, immersive art is more favored by teenagers, expanding the scope of the audience.

Compared with traditional art, immersive art is more convenient in the form of communication. The spread of virtual environments allows problems such as transportation and exhibition to be avoided, and the audience can use VR glasses to view the work anytime, anywhere. This saves viewers time and is able to attract viewers from all over the world. Through the introduction of VR technology, immersive art innovates in viewing modes and interaction limits, bringing a richer and more direct art experience to the audience [3].

Compared with traditional art, immersive art has obvious differences in viewing mode, interaction limitation, control and audience. The emergence of immersive art has brought new innovative possibilities to the art field, providing the audience with a deeper and more personalized art experience.

3. VR Innovation Technology analysis

In the field of art, VR innovative technologies and tools bring unique ways for artists and audiences to experience and interact.

First, the application of 360-degree photography technology in the field of art provides a more immersive viewing experience for the audience. This technology allows photographers to capture images in one panoramic range, showing the panoramic environment and landscape. By wearing VR glasses, the audience can freely adjust the Angle of view in the virtual environment and enjoy the all-round picture. Whether in art exhibitions or online art creation, the audience can experience realistic virtual scenes through 360-degree photography, which is integrated into the art works and enhances the immersion of the viewing experience (Fig.1) [4,5].



Fig.1 VR art [5]

Second, virtual sculpture and stereoscopic modeling technology expand the creative space of artists, enabling them to create three-dimensional works that are not bound by physical constraints. With these technologies, artists can use virtual sculpture tools and modeling software to create works of art with unique forms and structures. The audience can enjoy these works in a virtual environment through VR technology, and even interact directly with the virtual works through interactive technologies such as gesture recognition. This interaction enables the audience to participate in the process of artistic creation, creating a more personalized viewing experience [6].

In addition, motion capture technology plays an important role in virtual art creation. Artists can use motion capture devices to capture the movements of real human bodies and apply them to the creation of virtual characters. Through this technology, artists can break the constraints of time and space to create vivid and realistic virtual characters that can interact with the audience. For example, in virtual dance performances, artists can use motion capture technology to transform the dancers' movements into those of virtual characters, and the audience can wear VR glasses to dance with the virtual characters, creating a unique viewing experience.

Finally, the design of interactive interfaces based on gestures and eye tracking has become an innovative tool in the field of art. These tools allow viewers to interact with virtual environments in a more natural and direct way by recognizing their gestures and gaze points. Viewers can use gesture recognition technology, such as waving their arms, pinching their fingers, etc., to change elements in the virtual environment. At the same time, eye-tracking technology can capture the audience's gaze point and achieve gaze interaction. Viewers can select different displays or works of art by staring directly at a virtual button. This interactive approach enables the audience to shape the artistic experience in the virtual environment more autonomously, breaking the boundaries between the traditional audience and the work [7].

4. The impact and feedback of VR technology on art experience

Through immersive VR art experience, the audience's aesthetic perception and emotional resonance have changed. Audiences can experience the emotions and meanings conveyed by the works of art more deeply, creating a more personal and engaging artistic experience [8]. Perhaps we watch in the museum, because of the noisy environment and the flow of people, so that we have no way to calmly and seriously appreciate the works. By viewing a painting in a virtual space, the viewer can more directly feel the emotions expressed in the picture, and interact and change the picture according to their own mood and experience.

With immersive technology, the relationship between artist and audience is reconstructed. There is a certain distance and estrangement between the traditional audience and the artist, but the immersive art design experience allows the audience to get closer to the process of art creation. The audience can feel the creative intention of the artist and the story behind the art work in the virtual

environment, and establish a more direct and intimate connection with the artist. Now museums in many areas begin to hold online VR museums, which can not only spread knowledge and history, but also protect the safety of cultural relics to the maximum extent [9]. It is not bound by time or place, nor by the fear of destruction or theft. The audience does not have to worry about destroying the objects when they pick them up to study and view them, they can stand in front of the canvas like the artist, feel the brushstrokes and the texture of the paint, and share the creative process and inspiration with the artist.

The immersive art design experience based on VR technology provides a higher level of participation and interaction for the audience. The audience can freely move, interact and change the elements of the artwork in the virtual environment. They can actively explore virtual art Spaces, interact substantively with artworks, and create personalized experiences. In terms of interior design, technicians can construct the size and structure of the interior through VR, and create a house that they are satisfied with according to the needs of different customers. This can greatly save a lot of costs can also let customers feel the appearance of the decoration in advance and avoid a series of problems caused by customer dissatisfaction after decoration. Customers can even draw in the virtual environment through gesture recognition technology, and co-create with virtual art works [10,11].

5. Conclusion

This paper thoroughly analyzes the fundamentals of VR technology, presenting a comprehensive discussion on the distinctions between VR art and traditional art forms. Furthermore, it delves into the exploration of innovative VR techniques employed in art creation, shedding light on the unique opportunities and challenges presented by the fusion of technology and artistic expression.

Based on the above analysis, VR technology has great innovation potential and prospect in the field of art design. The application of immersive technology in art design can not only expand the form of artistic expression, but also provide a new artistic experience. However, the development of virtual reality technology still faces some challenges, such as the high cost of equipment, user dizziness and other issues. However, as technology continues to advance and costs decrease, these problems will gradually be solved. In the future, the development direction of virtual reality technology in the field of art should focus on technical improvement, user experience optimization and education and training. In terms of technical improvements, it is necessary to continuously improve the performance of virtual reality devices, reduce latency and improve display quality to provide a more realistic and smooth virtual experience. At the same time, efforts should also be made to optimize user experience, reduce user discomfort when wearing VR devices, and improve user comfort and satisfaction.

In addition, for artists and designers, more education and training are needed to help them become proficient in virtual reality technology and creative tools. This effort will help push artists and designers to better utilize virtual reality technology to create stunning works of art.

All in all, virtual reality technology has brought a broader development space for art design and highly innovative artistic expression. With the continuous progress and development of technology, the application of virtual reality technology in the field of art will become more popular and mature, bringing more rich and in-depth art experience for artists, designers and audiences.

References

[1] Jiang Piao. A Study on the Formation of Informationized Teaching Specialty for Higher Vocational Teachers. Soochow University, 2021. DOI: 10.27351/d.cnki.gszhu.2021.001100.

[2] Spectacular Appearance of Shijingshan District at the 2023 Service Trade Fair. Beijing Daily, 2023-09-04 (004). DOI: 10.28033/n.cnki.nbjrb.2023.005011.

[3] Luo Ting, Li Taoran. The New Mission of Art Theory in the Era of Artificial Intelligence. Yishu Baijia, 2021, 37(05): 34-41+67.

[4] Liu Yongchang. "Mobile" Television: Media Restructuring and Reshaping in the Perspective of Modernity. Contemporary TV, 2023(08): 30-35+72. DOI: 10.16531/j.cnki.1000-8977.2023.08.017.

[5] VR Future Perspective, https://m.manamana.net/activityDetail/523#!zh

[6] Hu Jingxian. Innovative Application of Lacquer Art Works in the Perspective of Metaverse. Journal of Hubei Second Normal University, 2023, 40(07): 45-51.

[7] Cao Minshu. Removal and Recreation: Multi-dimensional Spatial Construction of Dance's Vivid Communication Chinese Ethnic Exhibition, 2023(10): 132-134.

[8] Bai Chenlu. Combination and Application of VR Technology and Digital Media Technology. Information and Computer (Theoretical Edition), 2022, 34(21): 184-186.

[9] Chen Deping, Tong Jiajun. Technologically Embodied Era Mapping, Theme Types, and Dialectical Thinking: A Case Study of "Black Mirror". Jingchu Journal, 2023, 24(04): 38-44. DOI: 10.14151/j.cnki.jcxk.2023.04.003.

[10] Millet, Zhao Linuo, Bao Yihua, et al. Exploring the Future of VR Content Creation: Interview with Director Millet. China Film Market, 2022(04): 4-9.

[11] Wang Yamin, Li Shuang, Guo Kunguang. Analysis of the Current Situation of Cloud Exhibition and Exploration of Development Towards the Era of "Metaverse" China News Technology Workers Federation. Proceedings of the 2022 Academic Annual Conference of China News Technology Workers Federation. Proceedings of the 2022 Academic Annual Conference of China News Technology Workers Federation, 2022: 268-273. DOI: 10.26914/c.cnkihy.2022.075768.