The Application of Virtual Reality Technology in Environmental Art Design

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Abstract: With the continuous development of science and technology and economy, environmental art design began to apply virtual reality technology, which is also in line with the characteristics of virtual reality technology. The application of virtual reality technology can visually display the situation of environmental art design, effectively improve the accuracy of the budget, and the design process is also more interactive, which can effectively display the scenery, so the virtual reality technology is in the field of environmental art design. This paper mainly discusses the application of virtual reality technology in the field of environmental art design, thus promoting the better development of Chinese environmental art design.

1. Introduction

At present, computers have played a very important role in the field of art design, especially the application of virtual reality technology in environmental art design, the effect is very significant. Virtual reality technology can not only make environmental art design faster and more accurate, but also effectively reduce the intensity of manual labor [1]. It can also promote the innovation of environmental art design and help designers create diverse design works. However, due to the application cost and technical maturity of virtual reality technology, the application of this technology in environmental art design is still relatively narrow, and it has not been widely promoted.

2. The concept and basic types of virtual reality systems

The types of virtual reality systems can be divided into the following three categories according to their functions:

1) Immersion virtual reality technology system. This is a relatively expensive and complex system that requires a full set of sensor tracking devices to interact with the virtual world [1]. However, it also has its own advantages, that is, it can effectively isolate the external interference, and it is convenient for the user to fully devote himself to the virtual environment, and has the characteristics of feeling realistic and simple operation.

2) Simple virtual reality system. This system consists of only one ordinary computer, and the user only needs to interact with the virtual environment through a keyboard, a mouse, and the like [1]. For example, Apple's fast virtual system guarantees visual effects through 360-degree shooting. This system has the huge advantage of low price, easy to popularize and promote, and simple structure.

3) Shared virtual system. The biggest feature of this system is that multiple users can operate and observe the same virtual environment through remote network colleagues to achieve the purpose of collaborative work [2]. The above three virtual reality systems have their own advantages, and users can selectively use them according to their own situations.

3. The characteristics of virtual reality technology

Virtual reality technology, it also known as the virtual environment technology, mainly uses computer network and graphics technology, multimedia technology, intelligent technology, multi-sensor technology and simulation technology to create a three-dimensional virtual mode, and combined with related interactive devices to concretely reflect [2]. In general, virtual reality technology is a new type of information technology, which is particularly comprehensive and capable

of generating a multi-dimensional information environment. It has a broad application prospect and development space. Virtual reality technology also plays an important role in environmental art design by virtue of its outstanding advantages.

3.1 Efficiency.

The application of virtual reality technology in environmental art design can effectively improve the efficiency of design work and also play a certain role in improving design quality [2]. Because the environmental art design work is more complicated, in the design process, we must conduct a comprehensive analysis of various influencing factors. Especially when applying virtual reality technology, it is necessary to ensure that it meets the needs of the times, and thus achieves the improvement of design quality and work efficiency.

3.2 Interactivity.

The use of virtual reality technology can fully display the environmental art design works, and digitally convey the information of the exhibits in the virtual environment, thereby realizing the information receiving, understanding and feedback [3]. The virtual environment created by virtual reality technology is more realistic, which can stimulate the user's touch, hearing and vision, thus creating a real interactive experience, so the technology has certain interactivity.

3.3 Artistic.

The application of virtual reality technology in environmental art design has high requirements for image processing technology. Through various forms such as panoramic picture, 3D virtual modeling and Flash, the corresponding image can be fully displayed to make it more authentic and artistry [3]. When observing images, systematic understanding of project structure, process and material characteristics can be realized, which reflects the fundamental role of virtual reality technology.

3.4 Multi-perception.

Because the development of virtual reality technology is relatively short, there is no decent design rule when designing the corresponding work, and it is difficult to guarantee the design quality [3]. For environmental art design work, we must pay attention to people's sensory feelings, and then meet people's needs, and virtual reality technology can bring people a real feeling, reflecting the multi-perception of the technology.

4. Key technologies in virtual reality technology

4.1 Environmental modeling technology.

Environmental modeling technology is mainly to obtain the corresponding virtual environment model by acquiring the three-dimensional data in the real three-dimensional environment, and according to the needs of the actual application, so as to provide scientific and effective reference and basis for the actual work, improve the work [4].

4.2 Tactile feedback technology.

Tactile feedback technology uses high-tech means to directly manipulate the generated virtual objects in the virtual reality system to sense the reaction force generated by the virtual objects, thereby achieving an immersive effect and more accurately reflect the actual situation [4].

4.3 System integration technology.

In virtual reality systems, a large number of perceptual models and perceptual information are included, so system integration technology is crucial [4]. In general, information integration technology includes model calibration technology, information synchronization technology, data conversion technology, and synthesis technology.

5. Application of virtual reality technology in the field of environmental art design

5.1 Make use of virtual reality technology to make up for the shortcomings of environmental art design.

Environmental art design will be limited by various realistic conditions, such as lack of space and insufficient funds, which will lead to the inability to carry out environmental art design [5]. Virtual reality technology can simulate various scenes, so that various defects in environmental art design will be effectively compensated, such as Fig.1.

Fig.1 Virtual reality technology in environmental art simulation design

5.2 Use virtual reality technology to avoid actual operational risks.

Environmental art design is limited by various realistic conditions, and there are various dangerous situations in the actual operation process. In order to ensure the safety of their lives, people will not work through hands-on experience. Virtual reality technology can simulate situations in which people can't participate. People can work in a simulated environment to avoid potential dangers and get real feelings [5].

5.3 Demonstrate environmental art design works.

In the context of China's urbanization process and the rapid development of the real estate industry, people's demand for environmental art design has gradually increased. Especially in the urban planning process, environmental art design occupies a very important position. In the display design, in order to display high-tech and high-quality design works, it has been transformed from the previous hand-drawn drawings to the current virtual reality technology display, such as Fig.2. Compared with the previous methods, the application of virtual reality technology makes the works more innovative [6]. Through the construction of software and hardware platforms, it can create a real and lively virtual environment, bringing visual, auditory and tactile sensations to users. The experience of the aspect enhances the sense of cognition of the virtual environment and realizes the good display of environmental art design works.

Fig.2 virtual demonstrate environmental art designirtual

5.4 Virtual reality technology can break through the limitations of space and time.

Virtual reality technology can break the limitations of space and time, and can simulate any kind of scene, such as the vast universe, dust particles and even hundreds of millions of years ago. . Designers can explore and research in a simulated environment without being limited by space and time. For example, people want to study the era of dinosaurs, but the dinosaurs have become extinct, which has made people unable to conduct effective research [6]. Virtual reality technology can simulate the era of dinosaurs' survival. People can contact dinosaurs in the set situation and learn more about dinosaurs. era. Simulating this scenario frees you from time and space constraints and enables effective simulation of real-world scenarios that people need to understand.

5.5 Enhance the interaction between the two sides of the design.

Applying virtual reality technology to environmental art design works can highlight the strong charm and achieve good communication and interaction between designers and customers. The customer is able to enter the designer's design room, examine each detail, and grasp the connections between the various design parts, while clarifying the use of the overall design work [7]. In addition, customers can analyze the real design and communicate well with the designers to prevent conflicts between the two parties due to some problems. In the design and display of previous works, it is impossible to achieve such interaction.

5.6 Real-world systems can be built using virtual reality technology.

There are various restrictions in real life, making it impossible for environmental art design to experiment and operate in a real environment, shown as Fig.3. Virtual reality technology can simulate real scenes and simulate people, animals, plants, etc., so designers can work in the environment [7]. For example, when designing the Xi'an Tianmu Square, it is a large skylight designed with virtual reality technology, which makes people feel like they are in the vast starry sky, with powerful power. In this scenario, the functions of virtual reality technology can be fully utilized.

Fig.3 Virtual reality technology can build a reality system

6. Prospect of virtual reality technology

In recent years, the development of virtual reality technology is very fast. Compared with traditional environmental art design, the application of virtual reality technology in environmental art design can break the traditional thinking restriction and utilize the comprehensive design expression, thus the transmission channel [8]. There will be no significant impact, so the generation and transmission of design information will not be affected, and the influence of the two-dimensional ruler on the form will be reduced.

With virtual reality technology, environmental art design work is more convenient, and data of

various types of space environments can be utilized. The future development of virtual reality technology is to continuously improve equipment and strengthen processing capabilities. In the end, it can be better applied to environmental art design, so that environmental art design can be better developed, and the potential of environmental art design can be fully explored. Out of the subtlety and complexity of environmental art design. Environmental art design work uses a variety of virtual reality technologies and tools to obtain rich resources and continuously develop its theoretical research and applied research. It should be noted that there are still many imperfections in the current virtual reality technology, but there is still a lot of room for development in the design field, which can meet the various needs of people. Designers must adhere to the people's service in the process of environmental art design, and attach great importance to people's various needs for the environment [8]. This is more complicated in the actual design process, but the most important thing in design is to take care of the customer's feelings.

7. Summary

With the development of science and technology, architectural animation technology and network technology have made rapid progress, and in this context, virtual reality technology has also developed. The emergence of virtual reality technology has greatly contributed to the design of environmental art, and this technology can play the role of other technical methods to replace. Therefore, in the future, we need to further explore the virtual reality technology and continuously tap the potential of this technology, so that this technology can have a broader development prospect in the future and make greater contributions to environmental art design.

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