Application of Virtual Reality Technology to Environmental Art Design

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Abstract: In this paper, the basic features and main technologies of virtual reality technology are introduced. Besides, its practical application in environmental art design is analyzed for your reference.

1. Introduction

Virtual reality technology, also known as VR, is a simulation system based on computer technology, which can build and experience the virtual world created by computer simulation system. Virtual technology refers to the use of computers to construct a simulation environment. It is a visual three-dimensional dynamic vision with interactive integration of multiple information resources as well as a simulation system providing real experience, which can satisfy users in the created simulation environment.

2. Basic Introduction of Virtual Reality Technology

Virtual Reality (VR) Technology is the orientation of research and development of simulation technology, and is the application goal of ultimate present. It integrates simulation technology with computer graphics technology, man-machine interface technology, modern multimedia technology, widely used multimedia technology and modern developed network information technology, which is a very innovative and challenging field of scientific research. VR technology mainly relies on computer technology and related sensing equipment to simulate environment, sensory perception, natural technologies and so on. Through realistic and dynamic three-dimensional graphics, people are made to create a sense of being in the real environment. Applying perception technology to real technology will mobilize people's perception of sight, hearing and touch as well as perception of motion, force, smell and taste in many ways, also known as multi-perception. Natural technologies refer to the use of computers to process participants' body motion and sensory data, make relevant responses based on different data, and give feedback to users' five sense organs. Sensor devices, namely, transmission devices that can interact with three-dimensional technology.

3. Introduction of the Characteristics of Virtual Reality Technology

3.1 Multi-perceptional Characteristic

Usually, the process of human perception of real objects mainly depends on the perception of sight, touch, hearing and so on. The best effect of VR technology is to achieve a real panoramic simulation effect by mobilizing people's multiple perception abilities. In addition, it also has the ability to mobilize other perceptions. In the virtual reality environment, it has the perception function that human beings have. However, as far as the current technological development is concerned, further research, development and improvement are needed to achieve the desired results.

3.2 Interactive Characteristic

Interactive characteristics in VR technology mainly refer to the interaction effect between simulation system constructed by computer and human beings, that is, the virtual environment created by computer multi-perception technology and natural technology. People can communicate

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and interact with the scene related to the virtual environment. In interactive communication, the virtual scene will become more and more concrete. In practical application, VR technology presents considerable value to people's technical practice, which can be used to help people simulate the scene effect, to build various kinds of production and life, and to make more intuitive planning and judgment.

3.3 Existence Characteristic

Existence Characteristics mainly refer to user's simulation environment by making use of simulation systems such as computer, which achieves a feature with high authenticity that is difficult to distinguish between true and false. It is an ideal state of the environment constructed by VR technology that makes it difficult for human beings to distinguish false feelings, which is difficult to realize at present.

3.4 Autonomy Characteristic

In the environment of virtual construction, the development law and trajectory of objects mainly refer to the real world, and it follows the physical trajectory and related laws of the real world, which is the autonomy characteristic.

4. Main Virtual Reality Technologies in Environmental Art Design

4.1 Modeling Technology

Modeling technology is a very important and valuable tool in environmental art design, and is the main technology of building virtual environment. According to designers' specific requirements, the modeling technology takes the real scene as a reference, carries on three-dimensional data calculation, and then designs a virtual environment with great reference value.

4.2 Image Generation Technology

Three-dimensional image generation technology is of great significance for the construction of virtual environment. We must ensure the authenticity and clarity of the generated image, provide image reference for the environment builder, and help them make better environmental design. But at present, in order to achieve high-definition image rendering effect, it also needs to continue to improve and develop.

4.3 Acoustic Display Technology

In order to enhance people's sensory perception, VR technology needs to mobilize different human senses in order to achieve a variety of stimulating effects. As far as VR technology is concerned, it is mainly affected by the difference of recording orientation and parallax effect caused by visual difference between display technology and naked eye viewing.

4.4 Tactile Technology

Data gloves and data clothes with excellent performance are the preferred equipment. Because of their original design of vibration contacts, users are able to get a touch experience, which is conducive to increasing the real feeling of three-dimensional space.

5. Application Analysis of Virtual Reality Technology to Environmental Art Design

5.1 Provide New Ideas for Environmental Art Design

VR technology has a variety of advanced technical means, which can provide adequate technical support for environmental art design. Therefore, the application of VR technology to environmental art design will break the conventional comfort, break through the traditional inherent knowledge, and provide new ideas and inspiration for designers. It can inject new vitality into environmental art design, make it develop and improve, and optimize use effect to a certain extent.

VR technology makes environmental art design more intuitive and make designers understand its

specific use in actual production better. From manual drawing to computer simulation drawing to architectural animation is the gradual development process of environmental art design. Due to the limitation of the real environment and the interference of various complex other factors, designers are often unable to break through and develop, and their design results fail to reach their desired state. The application of VR technology to environmental art design can show the design effect through data simulation, which is real and intuitive, enable designers to develop deficiencies in creative design and stimulate designers to generate new ideas and inspiration, thereby improving the design effect. Not only that, it also to a certain extent, saves the production time of finished products and the actual acceptance of users.

The application of VR technology to environmental art design enhances the interaction between users and designers. Designers are allowed to use VR technology to visually present designs to users after primary design, then make modification and adjustment according to customers' opinions and meet users' needs to the greatest extent. Users and designers rely on VR technology to communicate, elaborate design concepts and the relevance of various design links, which is conducive to improving user satisfaction of design products.

5.2 Enrich the Means of Environmental Art Design

VR technology provides designers with a variety of technical means in environmental art design, which is conducive to helping them solve a variety of complex problems, greatly improve the accuracy of design, and make the design diversified. VR technology mainly includes modeling technology, tactile technology, multi-perception technology, system integration technology, etc. Designers can select relevant technologies according to the actual needs of environmental art design to assist themselves in completing the design work. Environmental modeling technology can help designers to build a three-dimensional data model of real environment according to the actual environmental needs, and present the environmental design in the virtual model, which is conducive to users' viewing and improvement. Tactile technology can help designers understand the reaction of virtual objects in the virtual environment when they are moving. It is helpful for designers to improve in order to achieve the requirement of tactile stimulation. System integration technology is a kind of complex technology, including many kinds of technologies, such as model calibration technology, information synchronous feedback technology, data conversion and synthesis technology, which can be used when designers construct environmental art. As far as Auto CAD is concerned, it is a kind of computer aided design software, which can be used for two-dimensional drawing, protracting, documenting and three-dimensional design. Here it is abbreviated as CAD, which can visualize Abstract concepts to customers, enhance communication, reduce duplicate modifications caused by poor communication, and improve design efficiency. As far as the assistant technology of remote sensing photography is concerned, it can accurately display buildings and building groups in an all-round way, which is propitious to comprehensive consideration of design and scientific planning.

5.3 Make Environmental Art Design not Restricted by External Factors

In the past, traditional environmental art design was greatly influenced by spatial factors. If the environmental design scheme conflicts with its spatial scope, the overall design will not be suiTable for actual production. The emergence of virtual environment technology greatly compensates for this defect, making it no longer subject to space constraints, and the environment design space constructed has a strong practical value. Through VR technology, users are made to feel its design connotation and concept, which is conducive to its real production and use. At the same time, it also improves the success rate of the design. The application of VR technology to environmental design is a new practical method with visual operation and experience, which is constructed by using computer system, sensor technology and multimedia technology. It can present designers' design idea and the effect of actual construction.

5.4 Avoid Related Problems in Environmental Design

Environmental art design is a diversified design with high practical significance. Its design

requires the use of a variety of modern science and technology and various disciplinary knowledge. If problems and omissions occur in the design, the actual conversion rate of the overall design will be greatly reduced, or even need to be redesigned. VR technology makes a visibility transform of Abstract design data and concepts through the construction of three-dimensional data model, Tables, curves, legends and other ways, providing designers with reference conditions. VR technology can be seen as a combination of foreground simulation technology and background simulation technology, which is conducive to the construction of computer system simulation technology. Its essence is the integrated application of many kinds of information technologies. The simulation system makes use of operation instructions to construct a virtual environment in the context of environmental art design, which is helpful for designers to find the design omissions and deficiencies in the environment of virtual construction, and make remedies and changes for them. The application of VR technology to environmental art design can effectively avoid designing problems, improve design efficiency, and improve the conversion rate of production and use.

5.5 Help People Avoid Danger

The effect of environmental art design is affected by many factors, so it is difficult to experience personally. However, in the actual production process, there may be some unsafe factors due to construction operation and external environmental conditions. The application of virtual technology in this area will minimize the risk in environmental design by constructing virtual places and checking unsafe factors in design. At the same time, through the construction of simulation environment such as commissioning, the potential risks of construction operation can be shown, and the relevant team of enterprises is able to make certain plans and safety operation rules according to this, so as to avoid dangers in commissioning and ensure the efficiency of environmental art design in the actual transformation.

6. Conclusion

To sum up, the implementation of environmental design art in cities is a gradual process. We must consider comprehensively and plan as a whole. The restrictive factors and potential risks in the implementation of environmental art design must be considered comprehensively. The application of VR technology to environmental art design meets the requirements of transformation of environmental art design in cities. It can break the restrictions of space and time and other factors and avoid risks, making it more meaningful for practical transformation in design and more in line with the actual construction situation. We should correctly understand the characteristics and concepts of VR technology, attach importance to its application to environmental art design, and promote the sustainable, healthy and steady development of environmental art design industry.

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