Application of Virtual Reality Technology in Interactive Analysis of Residential Interior Design

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Abstract. This article briefly introduces the concept, characteristics, classification and application of virtual reality technology; analyzes the application and development of virtual reality technology in the field of residential interior design, expounds the feasibility of virtual reality technology in the interactive analysis of residential interior design, A method for constructing an interactive analysis system of residential interior design based on virtual reality technology was proposed, and the immersive interactive expression of residential interior design was realized.

Keywords: Virtual reality technology; residential interior design; interactive analysis; application.

1. Introduction

In recent years, the number of construction projects in China has increased year by year, and residential interior design has attracted people's attention. In residential interior design, designers interact with users and apply virtual reality technology to ensure that residential interior design solutions are more Good implementation reduces resource waste. For residential interior designers, in actual work, advanced virtual reality technology can be used to build three-dimensional models, and in accordance with various needs of users, continue to optimize residential interior design solutions.

2. Overview of Virtual Reality Technology

Virtual reality technology refers to a technology that creates a three-dimensional virtual scene through computer simulation, and provides users with a feeling of immersive experience. It includes dynamic environment modeling technology, real-time 3D image generation technology, 3D visual stereo display technology and sensing technology. The specific working process of the system is to track the user's movements in real time through the sensing device, forming tactile and force feedback, and also performing voice interaction. The user experience scene mainly comes from the three-dimensional virtual space, and gives intuitive perception such as seeing, hearing, and touching to provide a real immersive experience.

The characteristics of virtual reality technology: authenticity-the environment created by virtual reality emphasizes the authenticity of human perception of space and objects, and mainly creates true sensory sensations from the four aspects of hearing, touch, vision, and smell; interaction -The user can use the sensing device to interact with objects in the visual environment and perform corresponding operations on the objects. The virtual environment can generate realistic natural responses through preset settings; Predictability-preliminary research shows that the virtual reality environment The behavioral activities are basically the same as the behaviors in the real scene, which can assist the study of environmental behavior, provide a virtual environment similar to the field in the laboratory environment, effectively eliminate uncontrollable factors in the field investigation, and improve the reliability of the research.

The classification of virtual reality technology: Simulate the real reality-that is, simulate the environment of things that exist in reality, users can experience it without having to be in the field. This model is widely used in the simulation of natural disasters such as floods and earthquakes, Virtual vocational training for pilots, doctors, etc..; Simulation of fake realities-such as fictional single-player, multiplayer large-scale magic games, and pre-evaluation of solutions in the field of architecture and interior design.

3. Application Development of Virtual Reality Technology in the Field of Residential Interior Design

Residential interior design activities are essentially a process of interaction between designers and users. The media for interactive communication has gone from hand-drawn renderings to computer renderings to architectural animation. Today, computer renderings of two-dimensional media are still mainstream. Media renderings based on computer renderings or animations are human-machine indirect communication. Although they can effectively express the designer's intentions to a certain extent, they lack the presentation of real-time effects after modifying the plan; at the same time, users cannot experience the experience Change the space, scale, psychology, aesthetics and other feelings brought by the design scheme. Virtual reality technology can meet this expression in the design of residential space. It can use an intuitive, visual and realistic technical method to present the designer's ideas and meet the needs of users' real experience.

The emergence of virtual reality technology has revolutionized the way designers work and provides new design methods. In the actual residential interior design, the designer can make reasonable use of virtual reality technology to modify and supplement the three-dimensional model scheme in the roaming space in real time through the customer's various requirements, interact with the user, and quickly and accurately compare various designs The feasibility of the scheme enables better implementation of residential interior design schemes, so as to avoid reducing waste of resources and economic loss.

In addition, virtual reality technology can also be used to study the acoustics, optical effects and structural performance in residential interior design spaces. Such as mastering the effect of natural light and artificial light, detecting the sound insulation effect in the house and the acoustic indicators of different spaces. This article mainly analyzes the specific application of virtual reality technology in the interactive analysis of residential interior design, so as to promote the progress and development of residential interior design industry.

4. Interactive Analysis of Virtual Reality Technology in Residential Interior Design

Interactive analysis of residential space structure design. The spatial structure change of residential interior design generally uses the way of space addition and subtraction to change the wall. If it is removed or the space is re-planned, the spatial structure design will directly affect the layout of the space. Virtual reality technology can be used to make real-time changes to the space wall, re-optimize the design scheme, and more accurately determine the rationality of the spatial scale, thereby reducing the loss and waste of space.

Interactive analysis of residential interior soft furnishing design. Residential interior design often takes a long time in the selection, placement and spatial arrangement of furniture, as well as the soft-fitting style, size, materials, color and placement. Different from traditional design tools, it supports designers to edit and compare the soft decoration elements in residential interior design in real time. Virtual reality technology can be interactively designed on the basis of three-dimensional models. Soft materials are selected in the material library and the colors are changed, and the communication design with customers is implemented, which is more convenient and faster.

Interactive analysis of blind spots in residential interior design. With the help of virtual reality equipment, designers can intuitively feel the changes in space during the design process, and improve the unreasonable parts of the design in a timely manner. The neglected "gray space" is easily generated during the interior design of the house. The process will cause a lot of unnecessary trouble for the designer. But the intervention of virtual reality technology can eliminate this problem. The residential interior designer can combine the characteristics of the engineering structure and use virtual reality technology to enter the space interaction system, thoroughly explore the blind spots in the design, and do a good job of improving the interior design of the residence.

5. Application Value of Virtual Reality Technology in Interactive Analysis of Residential Interior Design

As an advanced design tool, virtual reality technology transforms the design work platform from two-dimensional to three-dimensional, which greatly reduces the difficulty of expressing space concepts. Traditional design platforms require designers to have strong spatial imagination ability to complete excellent interior space design. Through the virtual technology designer, based on the construction of a three-dimensional simulation virtual environment, the immersive interactive space experience can be implemented through virtual reality technology equipment. In the virtual space created by virtual reality, designers can use the perfect combination of software and hardware to promote the communication and reaction between the users and the design scheme, and complete the excellent maneuverability.

5.1 Optimization of the Expression of Interior Design

Judging from the development status of our society, the application of computer technology in society has become a major development trend in society. Under such a social environment, the optimization of the expression form of interior design can be regarded as a manifestation of the application value of this technology. From the perspective of the designer's reflection on the interior design work, under the traditional model of rendering the design results, some customers often cannot fully understand the design effects they have shown, and they are using virtual reality technology. After application, virtual scenes have become the main expression of interior design effects, which has played a certain role in optimizing interior design methods.

Virtual reality technology helps designers, users, and electronic media to communicate more easily and quickly, and helps designers change design solutions in a timely and flexible manner based on the information reflected, which can promote the subjective initiative of users to participate in design. Shorten the sense of space and distance between people.

5.2 Integration of Information Resources

Judging from the development of interior design of residential space in China, the traditional design model is based on the designer's experience. This requires the designer to continuously summarize some of the design cases he has participated in during the development of the design work. Judging from the work in the traditional mode, the reorganization of existing materials often makes designers spend a lot of energy at this stage. In the application process of virtual reality technology, the design analysis interactive system based on this technology can use the information storage method to organize the design cases that the designer has participated in. In this way, the designer needs to retrieve the design case in the case of this system, this system can provide designers with the case materials they need in the first time. The analysis and interactive system based on virtual reality technology can greatly improve the designer by integrating information resources in practical applications. Work efficiency.

5.3 Promoting the Development of Residential Interior Design Industry

This way of working can ensure the cooperation and effective docking of various design departments, so that all design participants can be unified in a design environment. Designers and users gather together at the virtual solution site to participate in the discussion. The realization of this working method will greatly improve the designer's work efficiency, and will also bring about great changes in the residential interior design industry.

From the perspective of the entire residential space design industry, it is the original intention of designers to create a space that meets the user's requirements. Through virtual reality technology, users directly evaluate whether the interactive space is reasonable. This is the technology of virtual reality technology in residential interior design. Characteristics and advantages, it will bring a positive impetus to the residential interior design industry.

6. Conclusion

Through the use of virtual reality technology in residential interior design, not only can improve user space awareness, but also reduce the designer's time to rebuild and modify the design plan multiple times. Through traditional equipment and virtual reality technology, the residential space environment and the interactive system are organically integrated, which increases the immersion of the design scheme. At the same time, it can help users to enter the work to obtain a variety of perceptions such as vision, hearing and touch. Help users to create a feeling of real experience, so as to realize the interactive analysis function of residential interior design.

The design interactive analysis system built by virtual reality technology can bring a very good immersion to residential interior design and satisfy the user's sensory experience. It is the main role of virtual reality technology in the application of residential interior design. The promotion of this technology has a positive role in promoting the modernization of interior design.

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