Application of VR Technology in Interior Design

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Abstract. In the field of interior design,VR technology mainly takes the form of visual images and videos. From traditional 3D Max modeling to rendering two-dimensional images, to online platforms such as Kujiarle and Panorama IE generating panoramic roaming videos,VR technology is combined with interior design to transform interior design from form to interior.Allow innovation and development. The improvement and optimization of 5G network speed and VR technology improve the efficiency, cost and process of interior design, help interior design from design to intelligent experience of material selection, and expand the experience of VR technology in interior design. Taking the interior design of OFFICE HOME Apartment for young people in Suzhou as an example, this paper explains the embodiment of VR technology in the interior design process from three stages: concept of scheme design, scheme output and scheme report, and expounds the prospect direction of VR technology in the field of interior design [1].

Keywords: VR technology · Interior design · Application advantage · Architecture design

1 Introduction

Today, with the rapid development of modern science and technology, the rapid development of computer technology and digital technology, makes the three-dimensional visualization and collision optimization of many design software have great development space. The application of BIM and VR technology provides the foundation for the three-dimensional modeling of interior decoration design, section and elevation design optimization, etc. [2]. It meets the personalized and diversified needs of interior space design, and also broadens the application range of intelligent technology in interior decoration, providing better data reference, process analysis and design optimization design for designers. VR technology, in particular, is a 3D based technology that gives people a sense of being there. Compared with 2D and 3D technology, it has more pragmatic advantages. It can interact with real scenes, interaction and real scenes, so as to achieve better three-dimensional effect. As shown in Table 1 [3].

C. F. Peng et al. (Eds.): EIMT 2023, AHSSEH 8, pp. 545–550, 2023.
https://doi.org/10.2991/978-94-6463-192-0_71

2 VR Technology

(1) Immersion

Immersion is virtual reality technology. Using virtual reality technology, customers can personally experience the design process of the whole building in a virtual environment, and observe specific effects in three-dimensional space, so as to improve customers' understanding and identification of the building, and carry out corresponding design according to different needs [4].

(2) Interactivity

Interactivity is the virtual world in virtual reality. With the help of sensing devices, real and virtual scenes can be integrated together, so that players can perform various behaviors in reality, such as holding a cup, grabbing a cup, such as extreme sports, such as through a variety of different feelings to achieve interactive effects [5].

(3) Imaginative

Imagination means adding customers' design ideas based on their experience through VR technology. When the user wants to use a wallpaper color or a new wardrobe shape, the scene can be transformed according to the self-sensing Settings of the VR transmission system, so as to meet the user's living needs for indoor space [6].

The drawing procedure of interior design renderings is shown in Fig. 1.

Third, the application of VR technology in interior design.

The application of virtual reality technology in interior decoration can be regarded as a system architecture involving decoration, water heating and air conditioning design and other systems. Its overall architecture can be started from the aspects of demand analysis, system design, development, system implementation, system maintenance, and so on. It requires the pain points and difficulties of VR technology in interior design. In order

Table 1. History of VR technology

Time	Development stage	Carrier presentation
1935–1961	The embryonic stage of virtual reality concept	Stanley Weinbaum describes a pair of VR glasses in his novel
1962–1972	Technical limitations Virtual reality is still in the prototype stage	Sensorama's simulation simulator
1962–1972	Technology accumulation period	Cyberface, a virtual reality headset
1962–1972	The iteration period of the product	Virtual Boy with head-mounted display
2016 Till now	The explosion of virtual reality technology	Oculus Rift, HTC Vive; Cardboard; Gear VR; VR all-in-one machine

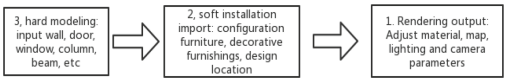

Fig. 1. Interior design renderings drawing steps

to meet the needs of customers, it can also design and display more detailed schemes, so as to complete the development and testing of VR system design, so as to ensure the safe, efficient and efficient use of the system, but also through the actual operation of the system, to provide reference for the optimization of the system. Virtual reality technology is the key to realize the virtual reality technology in interior decoration, but also the development and integration of the whole system, and virtual reality technology is the key to realize the virtual reality technology. As can be seen from the chart, in the design of the three-layer structure system, the data layer mainly uses modeling tools to establish the internal basic model and physical scene model, so as to meet the later decoration needs. The business layer is mainly responsible for realizing the functions of each system, such as the application of VR technology, personalized customized applications, etc., while the user layer is the basic interface for users to interact directly, which is used to fulfill the functional requirements of users.As shown in Fig. 2 [7].

In interior decoration design, virtual reality technology is applied in system function design, which mainly includes three aspects: three-dimensional scene display function design, three-dimensional roaming function design and customized module architecture design. The functional design of 3D scene is mainly to demonstrate the specific situation of interior decoration to users, which needs to be able to carry out different decoration and decoration for different users. And to the specific scenario for optimal demonstration. In this process, due to its interior decoration design to indoor air conditioning, furniture and interior layout optimization, interior layout and other physical models as the carrier, with the real-time data transmission of indoor space as the main goal, so that interior decoration design and customers for more direct communication and communication, and the design scheme will be presented. In the design of virtual space, through the

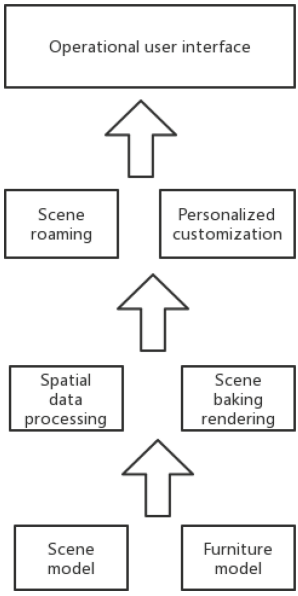

Fig. 2. Overall architecture design

potential space design needs, the use of scene roaming and interaction, can maximize the mobilization of users' visual, auditory and other senses, effective information release, transmission and feedback, so as to break through the limitations of space and time, improve the effect of indoor marketing.The system test is mainly to realize the effect of the controller after switching in different scenarios and enhance the user experience.As shown in Fig. 3 [8].

The application of virtual reality technology in interior design mainly includes: construction of indoor basic architectural model, construction of indoor model, model mapping processing, scene rendering, scene roaming and interaction. The basic structure of the building is established through the three-dimensional max method, such as the structure of doors and Windows, foot lines, restaurants, etc. In this process, the model structure can be simplified according to the specific characteristics of the architectural model, which will not affect the final interior decoration effect, as shown in Fig. 4 [9].

Scene rendering is to set the corresponding parameters before establishing the virtual scene with internal decoration structure, and input the scene model into the three-dimensional model in the form of document by using the rendering pipeline, empty box and color box with high inclination Angle, so as to increase the reality and visibility of the scene. Figure 5 shows that the seat position can be adjusted after pulling the trigger [10].

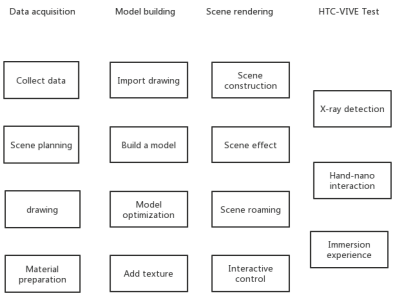

Fig. 3. Implementation path diagram

Fig. 4. Simplified effect of room furniture model

Fig. 5. Schematic diagram of chair position changes

3 Conclusion

By analyzing the immersion, interactivity, destructiveness and effectiveness of VR technology, this paper discusses the optimization and modification of VR technology in interior design and users' three-dimensional feeling. This technology can enable users and non-building engineers to have a better understanding of the interior designer's design intention and design ideas, reduce the time of measurement and drawing of workers to a certain extent, and improve the work efficiency. This not only saves a lot of money, but also reduces the risk of decoration. The introduction of 3D technology into interior design can make the interior visual effect better and better meet the needs of users, so as to promote the sustainable development and diversification of interior design industry.

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