

Probe into the application of VR technology in architectural design

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Abstract: With the rapid development of VR technology, VR technology has been widely recognized and applied in various industries. This article first provides an overview of VR technology and further clarifies the characteristics of VR technology; secondly, the application of VR technology in the model to building construction information, the application of VR technology in architectural display, and the application of VR technology in comparing various design schemes. It analyzes the specific application of VR technology in architectural design in four aspects, including the application of VR technology in remote observation of buildings. Finally, it proposes practical application measures of VR technology in architectural design.

1. Overview of VR technology

With the development of the times, VR technology has become more and more recognized by people. VR technology combines virtual and real environments and uses computer technology to form a realistic virtual environment, allowing people to immerse themselves in the virtual environment. VR technology uses basic data and uploads the data to the database, so that people can feel the real objects and environments in life in the virtual environment during the experience. It is a way of obtaining visual, auditory, and tactile sensory information through these devices. With the development of modern computer technology becoming more and more mature, VR technology has gradually been accepted and recognized by more and more people, and it has truly realized human-computer interaction, allowing people to get instant feedback during use. VR technology has also received recognition and attention from all walks of life, making the prospect of VR technology more and more broad.

1.1 Real immersion

Real immersion means that people experience the virtual environment under auxiliary equipment, allowing people to be immersed in the virtual environment.

1.2 Real-time interactivity

Real-time interactivity is the most important thing to ensure the authenticity, effectiveness and real-time of the user's operating experience. The basic head and wrist rotation and body movement are used to observe and operate the virtual environment, so that users can get natural feedback of.

1.3 Rich conception

In VR, people have richer ideas that must be immersed and interactive to give full play to their ideas. At the same time, it gives people a broader space for association and broadens the recognition of human beings.

2. The application status of VR technology in architectural design

2.1 The requirements for related computer equipment are too high

In traditional architectural design, the production of architectural renderings does not require separate modeling and rendering, and the requirements for related computer equipment are relatively low. VR technology is different from traditional architectural design methods. The use of VR technology requires a unified construction of the entire space for modeling. A large amount of model support is required for later detailed planning, design, layout and program selection, and there are high requirements for computer programming. , So the application of VR technology in architectural design requires strong related computer equipment.

2.2 The current popularity is not enough

As an emerging technology, VR technology has a low penetration rate in China. VR technology is only adopted by large-scale design projects. There is no development of related VR technology in some small and medium-sized design units and areas with relatively backward technological development. Traditional design methods are still used, so VR technology needs to be further popularized.

2.3 Capital investment is large and time-consuming

It usually takes a long time for designers to use VR technology to build virtual building models, which is less efficient than traditional hand-drawn and computer-drawn drawings. In addition, the use of new technologies will increase the capital investment in design.

3. Application analysis of VR technology in architectural design

3.1 VR technology is applied to building construction information in the model

The role of VR technology in constructing building model information is mainly reflected in two aspects. On the one hand, the data for building model construction is realized, and on the other hand, the way of model modification is more intelligent and automated.

(1) In the process of building a building model, it is necessary to create a three-dimensional model of the building based on the combination of various information modules, not a simple arrangement and combination of points, lines, and surfaces. For example, the architectural model is a horizontal projection in the plan view, and the corresponding projection is carried out in each direction of the architectural model in each three-dimensional plane, and the corresponding building profile can be obtained by projecting on the corresponding position. In the architectural model, the doors and windows The list can also be easily calculated, and the budget of related materials can be calculated immediately according to the specific area of the building.

(2) The establishment of a building model database has the characteristics of real-time and consistency. Because the building model information is an effective and fully integrated design model and behavior model, the specific data and content are related to each other. When using VR technology to modify some of the information, other data will also change accordingly, which truly and concretely reflects the relationship between related views and other views. In addition, there are also related relationships in dimensioning. The use of VR technology can improve the quality and efficiency of architectural design as a whole, and reduce the incidence of errors in drawing design.

3.2 Application of VR technology in architectural display

On the one hand, the use of VR technology in architectural design can display a variety of information such as the overall structure, spatial layout, indoor and outdoor environment of the building in front of visitors, effectively helping people understand and experience the building more comprehensively. On the other hand, architects can fully consider and design from various angles to better meet the different needs of various users. The architectural model constructed using VR technology can more specifically display the design information of the building. The architect and the construction unit can communicate and communicate effectively according to the 3D model,

thereby reducing the differences in design details and improving the quality and construction of the overall design and construction.

3.3 Application of VR technology in comparing multiple design schemes

Using VR technology, VR technology designers can quickly switch between a variety of different design schemes, can compare a variety of different architectural design schemes, and can modify the local details of the architectural design at any time, and can easily compare the previous schemes. Realize continuous optimization of design schemes. In terms of design details, the designer can use the 3D model to feel the difference in the appearance and internal structure of the building from the same viewing angle, which is convenient for the designer to compare its advantages and disadvantages more effectively and quickly, so as to choose the best design plan.

3.4 Application of VR technology in long-distance observation of buildings

The current traditional way of displaying buildings is realized through specific models and software operations. The use of VR technology can break through the display form of traditional buildings, and display the designed models in the form of web pages or other documents, so that people involved in multi-party architectural design can discuss from a distance. The architectural design plan allows designers to fully understand the needs of users and optimize and perfect the design plan in time based on feedback. The application of VR technology realizes the long-distance observation function, strengthens the flexibility of architectural design, and provides the technical material foundation for the creative design thinking of architects.

3. The practical application of VR technology in architectural design

4.1 The hardware system required to realize the combination of VR technology and architectural design

Use professional equipment to input and output data and information to realize the interactivity, conception and immersion of VR technology. The input devices for data information include steering wheel, handle and gloves for related data information. The output devices of data information include VR glasses, multi-channel or single-channel projectors and high-performance displays.

4.2 The software system needed to realize the combination of VR technology and architectural design

Use VR modeling to first perform geometric modeling and establish the required three-dimensional model in the scene; secondly, process the details of geometric modeling, including material processing, lighting processing and color processing; finally, describe the motion and behavior of geometric modeling.

4. Summary

In summary, the use of VR technology to optimize the process of architectural design provides designers with new ideas in the design process and displays buildings in a new way. It increases the accuracy of architectural design, improves design efficiency, and makes architectural design schemes more in line with people's needs, thereby helping to promote the stable development of my country's construction industry.

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