Application Research of Virtual Reality Technology in Landscape Design

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Abstract: With the development of virtual reality technology, its application in various fields of society has become more and more extensive. The application of virtual reality technology in landscape design is a very typical example. Virtual reality technology uses information science and technology to simulate a virtual three-dimensional space, giving people a new sensory experience in terms of sight, hearing and touch. The application of virtual reality technology in landscape design allows people to observe the landscape of three-dimensional space in an all-round and unrestricted manner, which greatly enhances the quality of landscape design, and also enables people to further understand and understand virtual reality technology. However, it should be noted that in the process of applying virtual reality technology for landscape design, virtual reality technology and information technology should be combined to achieve the purpose of three-dimensional image, three-dimensional and system integration technology integration, and then complete the landscape design task. This paper mainly analyzes and studies the application process and characteristics of virtual reality technology in landscape design and the corresponding precautions, in order to better apply virtual reality technology and landscape design.

With the rapid development of information science and technology, the application of computer network technology has also spread to all walks of life. In landscape design, computer technology also plays a very important role. Virtual reality technology is a computer simulation system based on computer technology. In landscape design, the application of virtual reality technology can effectively improve the quality of design schemes, making design schemes and works more scientific and more close to people's ideal needs. The rational application of virtual reality technology in landscape design can effectively improve the accuracy of art design, make art design more efficient and convenient, and at the same time make landscape design more artistic and creative.

1. The Concept and Characteristics of Virtual Reality Technology

1.1 The Concept of Virtual Reality Technology
Virtual reality technology is a kind of simulation technology that uses computer technology to create a virtual image. Through virtual reality technology, it can bring people a new sensory experience of sight, hearing and touch. For example, the mirage phenomenon that we can often see can give people a feeling of real existence. In the field of design, virtual reality technology can simplify the work of designers to a certain extent, so that their design efficiency is greatly improved. In real life, designers can use virtual reality technology to display reality in a variety of ways. For example, reasonable
Materialization and visualization can be used to create realistic images according to actual needs. At the same time, virtual reality technology can be simulated in any environment. In the simulation process of reality, designers and users can better find the defects in the design plan, and then promote the improvement of the whole program.

1.2 Main Features of Virtual Reality Technology

(1) Immersion. The immersive nature of virtual reality technology can make people feel immersive in the virtual environment, making them believe in the existence of the virtual environment. At the same time, in the process of virtual reality, immersion always plays a role, and people's feelings are in the objective world. Virtual reality technology pays great attention to immersion, which is the guarantee of pleasure and excitement of virtual experience.

(2) Interactivity. In a virtual environment, people interact with things in the virtual environment in the same way as in the real world. Among them, the subject of the interaction is the experiencer, and the object of the interaction is the virtual object, and the interaction between the two is comprehensive.

(3) Conceptuality. Conceptuality means that virtual reality can inspire people's thinking and create creative activities. In other words, let the experiencer in the virtual environment get new instructions, and then generate new ideas based on this.

(4) Action. Action refers to the fact that people can manipulate virtual systems in the virtual world in the actual action or manner of the objective world, and feel that they are in the real environment during the operation.

(5) Autonomy. Autonomy means that things in a virtual environment can move autonomously according to their own models and rules.

2. Application Process and Characteristics of Virtual Reality Technology in Landscape Design

2.1 Application Process of Virtual Reality Technology in Landscape Design

In the landscape design, there should be good flexibility between each attraction in the landscape, in order to better ensure the coordination between the attractions. Therefore, in the process of designing the landscape construction plan by using virtual technology, the designer must have a clear overall view of the landscape, can fully feel the design effect that will be presented after the design is completed, and then display it by computer technology. A stereoscopic image of the design. In this process, it is necessary to use the computer to properly combine the points, lines and faces in the design scheme, and finally display the landscape in the design completely. For example, rockeries, buildings, etc. can be visually displayed using computer technology, allowing designers to visually see all aspects of the attraction, and then to improve the design. It should be noted that although virtual reality technology can bring great convenience to designers, due to its high technical requirements, designers must have a solid grasp of relevant theoretical knowledge and practical skills. Flexible and effective use of virtual reality technology.

2.2 Application Characteristics of Virtual Reality Technology in Landscape Design

2.2.1 To show the space of garden design

Virtual reality technology can reasonably display the content of the design landscape in two or three dimensions, but in this process, the landscape information and related parameters may not be expressed. Therefore, in the process of applying virtual reality technology for landscape design, all angles and spatial details of the landscape must be displayed. Only in this way can the landscape design scheme be more reasonable and scientific.

2.2.2 Supplement the content not available in the drawing design

In the process of applying virtual reality technology for landscape design, designers usually communicate and communicate with the blueprint designer in order to solve the problems in the design process in a timely and effective manner, thus making the landscape design smooth. Carry out so that the designed landscape meets the requirements of the design drawings. In the landscape design
process, the application of virtual reality technology can not only supplement the content that is not available in the drawing design, but also simulate the content of the drawing through the stereoscopic display of the image, and visually display the landscape in front of the designer for convenient design. The division timely discovered the problems in the design of the drawings, and then timely revised and improved, greatly avoiding the problems that may occur in the construction process of the landscape, and effectively promoted the perfect combination of landscape design and construction.

2.2.3 Reference to public comments
In the landscape design process, it is also very important to involve the public and implement relevant supporting decisions. When designing landscapes, designers should not only pay attention to the impact of the surrounding environment, but also must closely cooperate with the construction team. Therefore, when applying virtual reality technology for landscape design, designers should actively and actively communicate and communicate with the public to solicit and adopt reasonable suggestions from the public. Only in this way can the designed landscape meet the construction needs.

3. Virtual Reality Technology in the Application of Landscape Design Considerations
In a complete virtual reality model, it should include scene size, unit, model collation, naming, node editing, texture, coordinates, texture size, texture format, shader, etc., and these basic content must be consistent Made of specifications. For program control management, a model file with clear classification, face savings, and production specifications is very important. At the same time, the following aspects should be paid attention to during the modeling process.

3.1 Proportion and Size
When modeling with virtual reality technology, the first step is to determine the unit length of the design, usually in millimeters. When making a single frame, if there is a CAD drawing, you need to establish the model in strict accordance with the CAD drawing. If there is no CAD drawing, you need to refer to the relevant photos and videos, and use the size of other objects as a reference to build the model. It is possible to make the produced monomer model conform to common sense.

3.2 Materials and Textures
For materials, only standard and multidimensional materials can be selected for design. Since the Specular Level and Glossiness attributes are not set before being imported into the map, they will not be adjusted after importing, so they must be set in max before importing. Generally, the material of the model is not checked on both sides. If a single-sided object has a transparent map, you must check the double-sided, such as fences, trees, flowers, and so on. Ambient: default gray; Diffuse: default gray; Self-Illumination: generally set to 20–30. If there is no empty sub-material in the multi-dimensional material, the ID number of the sub-material must be continuous, and multi-dimensional material nesting cannot occur, and the parameters in the Coordinates column of the material property are strictly prohibited.

3.3 Refinement of the Model
After the scene model is initially completed, it needs to be further drawn. In the process of refinement, the first thing to consider is to add elements that can enrich the scene. In general, the parts that are expressed by textures are mostly architectural details, such as the lines of the building facade, the window frames, and the protrusions on the facade. In the process of production, the texture used in the current building can be added to the original model based on the original model, so that the scene can be enriched without adding texture. In the refinement of the model, it is usually avoided to use the Boolean subtraction operation. This is because the operation can easily cause the model to be distorted, lost, etc., which leads to unnecessary trouble. For this, the designer can highlight through the spline. Two-dimensional graphics and editing sub-options in grid mode instead of Boolean operations.

3.4 Model Optimization
In general, the total number of virtual scene models, the total number of faces, and the total amount of
textures all have an impact on the final speed of the virtual platform. Therefore, in order to improve the speed of the virtual platform, it is necessary to optimize the model. This can be achieved by ignoring invisible and insignificant details, using textures to represent details, ensuring accurate reduction of model segments, editing model sub-objects, and removing child nodes that have little effect on the scene.

3.5 Light Baking
A good lighting setting can make the product show the real light and shadow effect. Therefore, the model light needs to be set in 3DSMAX for the Rendertotexture baking process. Through the baking process, the effects of the lighting materials rendered in the non-real-time environment can be converted into a real-time interactive environment, thereby improving the final effect of the model light and shadow. Therefore, the designer must master the good baking technology.

4 Conclusion
In short, the application of virtual reality technology in landscape design can not only reduce the workload of designers, but also improve the efficiency of designers. At the same time, the application of virtual reality technology will also have a disruptive effect on the way designers work and work. Virtual reality technology allows designers to present their designs through a three-dimensional space, which helps them to better evaluate the effects of the design, intuitively feel the problems and defects in the design, and target them. Modifications and improvements. In other words, the application of virtual reality technology in landscape design can better improve the efficiency of design, ensure the quality of landscape design, and maximize the design and construction requirements.

5. References
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