

Application of Virtual Reality Technology in Interior Design Research

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Abstract: In the process of continuous development of science and technology, it has more and more intersection with traditional interior design. This paper will take the current the most popular research application in the virtual reality technology in interior design as a thesis, based on its contents and characteristics are summarized, the key modeling separately by emotion, interior space and indoor display three aspects, the help of virtual reality technology can as well as Chinese traditional flower arrangement art to contribute in the development of interior design.

1. Contents and Characteristics of Virtual Reality Technology

1.1 Contents of Virtual Reality Technology

Virtual reality technology can also be called phantom technology. As a product of high integration of multimedia technology and computer technology, it can provide users with a three-dimensional virtual environment. On the basis of the above, simulation technology can provide maximum interaction between interactive system and users, and provide users with immersive experience. From this, we can see that virtual reality technology is a comprehensive technology, its significance lies in expanding the information environment, which is in line with the current development trend of the information age [1].

1.2 Technical Characteristics of Virtual Reality

Virtual reality technology also has many characteristics. it has multi-perception as a comprehensive technology. Multi-perception is based on the traditional media visual perception, including auditory, tactile and other perceptions. Multi-perception can be regarded as the core of virtual reality technology. In the future hardware development and research, it is also based on multi-perception. Secondly, virtual reality technology is characterized by strong interaction. Virtual reality technology can respond differently according to user's operation, and give different feedback, so that users can actually feel the change of space and material. Finally, the characteristics of virtual reality technology also include autonomy and existence. As a new technology, autonomy can break the constraints of traditional cognition and provide users with more adequate imagination space. Existence refers to the fact that the virtual environment created by VR is different from that created by traditional media. VR technology can achieve the purpose of making users difficult to distinguish the true from the false.

2. Application of Virtual Reality Technology in Indoor Space Emotion

2.1 Applicability of Virtual Reality Technology in Evaluating Emotionalization of Indoor Space

In the traditional emotional design of indoor space, it is usually done by the way of effect map and bird's-eye view. But virtual reality technology has more advantages than it. The following will show the difference between virtual reality technology and emotional design of traditional indoor space in the form of charts. Details are shown in Table 1.

Table 1. Difference Table of Virtual Reality Technology and Traditional Indoor Space Emotional Design

	Three-dimensional stereo imaging	Dynamic imaging	Real Time Rendering	Cost	Effect
Virtual Reality Technology	Contains vision, hearing, touch	Autonomous follower	Have	Higher	Strong
CAD	No such function	No such function	No such function	Low	Weak
Traditional model	vision	No such function	No such function	Low	Weak
Travel animation	Vision and hearing	The line is fixed.	No such function	High	Stronger

Through the chart above, we can confirm that virtual reality technology has certain advantages in spatial emotional design. At the same time, it can help users feel indoor space better in the process of user evaluation. At the same time, we can construct emotional design system from different perspectives by changing different modes of motion, to assist decision-making [2].

2.2 Emotional Experimental Design

In this paper, the emotional content of indoor space is summarized in the form of text and tables. It also needs to be supported by experimental knowledge. This paper chooses Vizard development platform as an example. The whole process is to select Vizconnect option in menu first, add tracker option in tab and set hardware device separately. After matching the helmet with the auto-matching function, the handle is matched. Similar instructions like "forward" and "backward" are input to the handle in the Transports tab. Then the virtual scene characters are selected in the Avatars tab to set interactive commands and saved as scripts. The specific scripts are as follows:

```
If-name--=="-main-":
```

```
initInterface ()
```

```
Viz. add ('Model name. osgb')
```

This experiment also has different emotional design requirements for different environments. For example, in the living room, the layout, color and shape should be considered for users. In the office, more attention should be paid to the use of indoor environment. Finally, in the commercial area, more attention should be paid to highlighting the characteristics of commodities and commercial atmosphere [3].

3. Application of Virtual Reality Technology in Key Modeling of Interior Design

3.1 Modeling Method based on Geometric Graphics

In order to realize the application of virtual reality technology in interior design, it is necessary to improve its key modeling. Its key modeling methods can be divided into geometric graphics modeling and image rendering modeling. Geometric graphics modeling model is very precise and interactive, but it has a high demand for hardware, and the amount of calculation is large, and the speed of rendering is often slow. At present, the application of geometric modeling in virtual reality technology often uses discrete coordinate points to confirm it, and generates surface modeling by implicit function surface and quadric surface. In texture, there are different ways of geometric modeling. Patterns, patterns and texts need to be constructed by color texture, while surface texture needs to be constructed by geometric texture. Finally, dynamic effects need to be in the form of process texture [4].

3.2 Image-based Rendering Modeling Method

In addition to geometric graphics modeling method, the application of virtual reality technology in key indoor modeling also includes image rendering modeling method. Image rendering and modeling methods can also be divided into IBR method and panorama method. IBR method needs the whole city function as the basis to select the fixed viewpoint, azimuth angle, wavelength and other reference factors in space. Its specific functions are as follows:

$$P=P(\theta, \varphi, \lambda, V_X, V_Y, V_{ZT})$$

Panorama method can be divided into three forms: spherical panorama, cube panorama and cylindrical panorama. In the process of constructing spherical panorama, 10 points of camera are used as the center of the sphere, which is more in line with the human eye habit and ensures the good connectivity of the scene. Cylindrical panorama is a simplified form of spherical panorama, which has the advantage of simpler [5].

4. Application of Virtual Reality Technology in Indoor Furniture

4.1 Design of Virtual Reality Technology in Indoor Display

The application of virtual reality technology in interior design appears in the field of interior furnishings. For example, in the process of designing interior tables and chairs, we need to construct a simple model according to the shape of the seat. After building a concise model, we can get a 3D physical model by calculating. In this process, we need to use mapping method to repair the scene effect continuously. The specific process is shown in Figure 1 below.

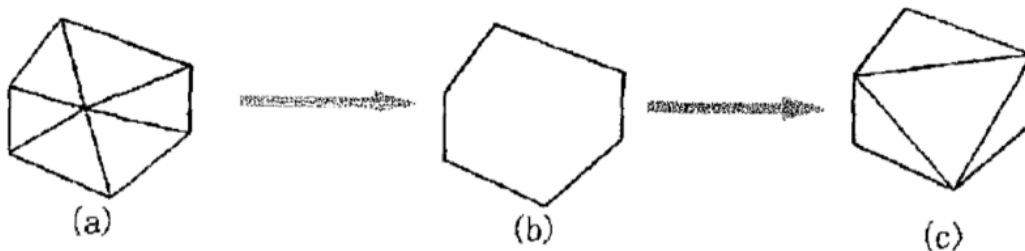


Figure 1. LPM simplified process diagram

Taking the design of lamps in interior design as an example, the difficulty in the process of lamp design is the construction of cross-section. Therefore, in practical work, the cross-section method is often used to construct the effect. The schematic diagram is shown in Fig. 2 below.

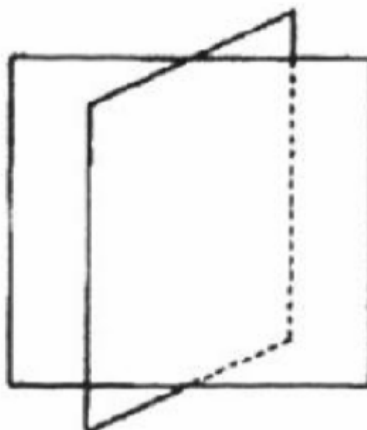


Figure 2. Plane schematic diagram of cross-over method

4.2 Realization of Virtual Reality Technology in Indoor Furniture

The design of virtual reality technology in indoor furnishings has been summarized by taking tables, chairs and lamps as examples [6]. Code is needed to support the actual use of virtual reality technology. The code of desk and chair model is as follows:

```
private var tempMap: vMainGui;
public var sdhelp: Texture;
public var daolantszvu : Texture;
public var DavoLanTuObj : GameObject;
public var venwu: Texture;
public var shevzhizxvTexture;
public var vavuil: Texture;
public var vavhu: Texture;
public var taiyangsdnviao: Texture; .
public var dajizmianju: Texture;
var vaxhigure: Texture;
public var svucong: Texture; .
public var caozbboolean=true;
public var benzolean=true;
public var celiang: boolean=true; .
public fengyin: boolean=true; f
public var xiaomap: boolean=false;
private var btnOveczboovzan=false;
public var caozv: Texture;
public var returndwai: Texture;
public var NoneButtonPic : Texture;
public var zowHezPic: boolean=false;
```

After completing the code, the model needs to be exported. Fbx software can be used in the process of exporting, and the scene format is set to FBX in the process of exporting, and then it is transferred to Unity3D engineering file.

5. Conclusion

Through the discussion in this paper, the application of virtual reality technology in interior design is studied from three aspects. With the continuous development of science and technology, virtual reality technology is constantly improving, and its application in interior design will naturally increase. I hope this paper can play a guiding role in promoting the better application of virtual reality technology in interior design.

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