Research on the Reconstruction of Ecological Environment by Virtual Reality Technology from Philosophical Perspective

Qin Liu\textsuperscript{a}, Ruliang Zhang\textsuperscript{b}

School of Humanities and Social Sciences, Xi’an JiaoTong University, Shanxi, China

\textsuperscript{a}598193927@qq.com, \textsuperscript{b}2921384651@qq.com

Abstract. Ecological environment has become a hot topic of human society. How to build an ecological environment system more in line with the development trend of modern life has become an urgent problem to be solved. This paper reexamines the ecological environment from the perspective of nature, human and society, we find that it is imperative to reconstruct the ecological environment. From the philosophical point of view, this paper studies on ecological environment problems and finds out the ways to solve the ecological environment crisis by means of technology. Nowadays, with the rapid development and wide application of virtual reality technology, its advantages are becoming more and more prominent. This research uses virtual reality technology to apply to ecological planning. Taking a certain place in Northwest China as an example, the virtual reality technology of VRML is used to create the virtual reality system of ecological planning to realize the reconstruction of ecological environment.

1. Introduction

With the rapid development of economy, the ecological environment has become an important research object in today's society. The emergence of ecological dilemma has caused more people to fall into panic. Studying the ecological environment and finding out the way out of the ecological dilemma has become an urgent problem to be solved. It is imperative to reconstruct the ecological environment.

Science and technology are the primary productive forces. The reconstruction of green ecological environment is not the abandonment of technology, but the need for new technology. As Marcuse emphasized, the liberation of nature does not require technology to return to its previous state, but requires technology to continue to move forward and make use of the achievements of technological civilization in different ways in order to achieve the liberation of man and nature. Therefore, technological innovation has become an important part of ecological environment construction.

Virtual reality is born from time to time. It essentially uses computer user interface technology to provide users with intuitive and direct sensing interaction methods such as sight, hearing, smell, taste and touch, which facilitates human-computer interaction and improves work efficiency. Virtual reality environment is an integrated environment composed of technologies such as imaging, sensors, speech recognition and network [1]. Based on an in-depth analysis of the relationship between human and nature, ecological environment planning begins to rationally plan human activities and greatly enrich the theory and practice of ecological planning by connecting with urban, rural and regional development.
2. Research on ecological environment under the philosophical perspective

With the promotion of science and technology, capital expansion has been growing day by day, resulting in the alienation of workers and labor products. In order to obtain more surplus value, large-scale production has caused serious deterioration of the ecological environment. The study of Marx and Engels' ecological philosophical thoughts is carried out under the background of the global ecological environment problem. Philosophical research has shifted from traditional philosophy to ecological philosophy (environmental philosophy). Its academic research can be described as multi-dimensional and multi-perspective, it is different from the western environmental philosophy, which presents rich connotation and unique theoretical character. It is not only a positive response to western ecological philosophy, but also an important prerequisite to promote the Sinicization of ecological philosophy. In the ecological philosophy of Marx and Engels, human is not only the product of the long-term development of nature, but also an important part of the composition of nature. Therefore, human are born of nature, and human cannot do without nature. Nature is like human heart. Without the natural environment, human cannot survive. Human can only rely on nature to survive and develop in society. However, human and nature interact with each other. Nature meet the needs of human unconditionally. Human can transform nature through hard work. Without labor, human cannot transform nature. The satisfaction of human spiritual and material life comes from making full use of nature. Therefore, human should deal with the way of getting along with nature, and adopt a positive attitude towards life that combats and cooperates with nature [2]. Only by expanding and developing human survival resources can we improve human living environment, thus forming a situation of mutual restriction and common development.

3. Construction of Ecological Environment Based on Virtual Reality

Engels said: "Civilization is a process of confrontation. The process, in its current form, makes the land barren, makes the forests barren, makes the soil unable to produce its original products, and makes the
climate worse [3]." In this study, it focuses on the ecological environment management planning project in a certain area in the northwest, the river management in this area, and the drainage of surrounding coal mining enterprises are improved, so that the river can achieve drainage, waterlogging, landscape and other functions, while restoring the natural features, the surrounding ecological environment can be improved.

3.1. Modeling Tools

3DS MAX and ISB are the main modeling tools for the system research. 3DS MAX is used in a wide range of applications, it gathers multiple functions, such as three-dimensional modeling, animation, rendering, etc., It meets the requirements of animation, games, scene reproduction and so on. Especially in the setting of virtual reality scenes, it restores the reality and delicacy. ISB is specially used for editing three-dimensional environment, realizes the creation of three-dimensional virtual reality in the visualized situation. In the simulation of virtual reality, extract tool can be used to hollow out, chamfer and render the scene and shape that have been formed. For example, different materials are used to render the surface structure of geometric shape, which is the unique function of ISB.

3.2. Virtual scene establishment

Twelve nodes of 3DS MAX are integrated to build three-dimensional models of scene layout elements such as building, road, lawn, vegetation modeling, sky, terrain, fountain, Flows, clouds, rivers, and simulated roaming.

Building, road, and lawn are modeled using VRML language nodes and edited with 3DS Max software, material nodes are used for material selection. Image texture nodes, pixel texture nodes, and coordinate nodes are used to write material texture and color.

Vegetation modeling can use two mapping methods. The first is that the image is processed into gif format in transparent background. The second is to use the lines in the 3DS Max to describe the outline of the vegetation. After extruding the modifier, the mapping is combined with the outline of the line and modified by using the UVW transform modifier.

| detail                      | LOD1          | LOD2          | LOD3          | LOD4          |
|-----------------------------|---------------|---------------|---------------|---------------|
| Building, road, lawn        | Block model   | Basic model   | Standard model| Fine model    |
| Vegetation modeling        | General symbol| Basic model   | Standard model| Fine model    |
| Sky and outdoor terrain    | DEM           | DEM+DOM       | High precision DEM+ high precision DOM | Fine model |
| fountain                   | General symbol| Basic model   | Standard model| Fine model    |
| Flows, clouds, rivers      | Center line   | Particle      | Standard model| Fine model    |

Sky and outdoor terrain. The first is the sky generation, which needs to be realized by using the background node of VRML language. Attention should be paid to the harmony degree of color in the three-color system. In the 3DS MAX, the sky scene layout is usually light blue, but it is too planar, simple and rough. In this model, spherical model is used to simulate the sky. In this model, spherical model is used to simulate the sky, and texture mapping is used to display the color level of the sky to enhance the fidelity. The second is terrain generation. After using MultiGen Creator node to model, using three-dimensional realistic terrain method, the data information in gray-scale image is read first, then the relationship between gray-scale and height is preprocessed, and then put into two-dimensional
data group. In the process of drawing terrain, height data are obtained through horizontal position, and then establish gray, height and horizontal three-dimensional coordinates to form a sense of high and low fluctuations, which are imported into virtual reality scenarios.

The design of the fountain. The 3DS Max tool models the fountain and uses particle system technology instead of the original wave texture technique. Particle system technology is more realistic than the simulation of wave texture technology and it can reproduce dynamic landscapes. Each particle needs to define certain attributes at random time to distinguish other particle states, including shape, size, color, transparent head and movement direction, speed, etc. At the same time, different attributes should be defined according to the change of time. As a difficulty in the virtual reality technology, the simulation of water effect is realized with the support of particle system technology [4].

Flows, clouds, rivers. Dynamic flow and cloud are mainly realized by texture mapping and coordinate transformation in the background of river or sky. After setting the static variables, the variables are updated after the counter starts, and the new texture coordinate variables are drawn to realize virtual scene of the dynamic flow or cloud.

3.3. Formation of tetrahedral model in the scene
The problem of ecological environment occurs in the naturalized nature, which is the interaction of nature, human and society. They are generally caused by human activities. In the meanwhile, human beings have learned that it is impossible for human beings to dominate and rule the natural world in the practice of communicating with nature [5]. Therefore, it is social practice that makes people fully realize that people can not live above nature but only in nature. Therefore, in the whole scene design, people's subjective initiative should be brought into full play. A more special tetrahedral mode is adopted, which can reduce the accuracy of the model while ensuring that the normal browsing function is not affected. The cross-section surface is used to simulate the distant model, and then there are maps on each level. The perspective can rotate around the model in all directions, and a complete model can always be seen, which greatly reduces the size of the model.

In order to reflect the subjective initiative of "human" and to be able to roam the scene in the virtual scene setting, the following functions are mainly set up. Firstly, the designer sets roaming according to his own size to assist in the deliberation of the details of his spatial design. Second, it emphasizes humanistic care and considers from the perspective of roamers of different ages and sexes to meet the needs of different groups of people for ecological landscape space. Pay close attention to the relationship between "human-virtual reality-environment" to solve the efficiency of human in the system, so that all walkers can experience the real-life role roaming in the virtual reality environment. It is necessary to program virtual reality and set up nodes according to the human scale in human engineering [6].

3.4. Realization of interaction in scene
Interactive scenes here include interactive static scenes and interactive models. Interactive scenes refer to virtual viewpoints or virtual characters that can walk and move in the whole virtual scene to change the perspective of the world. Interactive models refer to users who can plan and plan three-dimensional models with the help of functions provided in the pages.

In this system, two main types of roaming methods are set up, namely manual mode and automatic mode. The manual mode uses the VRML Navigation Info viewpoint navigation information point to implement. When the observer enters the virtual reality system, no matter what direction he is in, he can browse through changing the direction by manipulating the keyboard or mouse. The automatic mode is to set camera and its motion path in the 3D S Max scene and input it into the VRML scene [7]. After the observation route is arranged by the system, observers only need to browse according to the route. The function is implemented as shown in the following figure.
3.5. 3D scene visualization

Virtual scenes are divided into two categories in the virtual reality display platform which are large scenes and fine scenes according to the data range and fineness. Different types of scenes have great differences in three-dimensional model modeling standard, scene display effect and user browsing mode. The production process of the platform can be divided into three stages according to the sequence which are basic three-dimensional model making, virtual reality scene platform production and output of results packaging.

3.5.1. Basic three-dimensional model making. The basic three-dimensional model is imported into the Unreal 4 editor. All models are processed by mobile splicing, and finally all models are integrated into a complete scene model. The surface material of scene model directly affects the fidelity of scene visual effect.

3.5.2. Virtual reality scene platform production. Virtual scene production includes textures such as color, normal, and highlight. The color above affects the appearance tone and texture of the model. Normal mapping and highlight mapping will affect the vertical level of the model and the effect of highlight reflection. Insert a light source into the appropriate position in the scene and adjust the parameters in the parameter panel to achieve the best baking display effect. Parallel main lighting, skylight and global light source are simulated natural light. They also include lighting and spotlighting to simulate artificial light source [8].

3.5.3. Package release. After completing all scene settings and blueprint editing, the whole platform can be packaged and output as. Exe executable file with HTC VR terminal, and the virtual reality display platform can be opened by running the file directly. Through the browsing and running of the platform, the problems in the scene can be found in time, and return to the Unreal 4 editor for modification. Finally, virtual reality display platform with complete data and smooth operation is obtained. As shown below.

Figure 2. Parameter setting and routing diagram of the automatic navigation mode
4. Conclusion
In the process of transforming nature, mankind must respect the nature as the premise so that realize the harmonious coexistence between man and nature. Based on the study of Marx's ecological philosophy and modern virtual reality technology, this paper further expounds the possibility and Prospect of its application in ecological environment. In the actual ecological environment, the application of virtual reality technology can improve the level of ecological environment purification, thereby protecting nature and mother earth. The continuous improvement of virtual reality technology can play a more effective role in ecological environment design.

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