Research on the Application of Computer Artificial Intelligence Technology in Environmental Art Design

Fu Yi, Tan Hao

Shenyang Jianzhu University, Shenyang 110168, China

Abstract. Based on the computer virtual simulation technology, the article collects the original data of the environmental art design and then performs the edge processing of the environmental data and generates a three-dimensional environmental design system. At the same time, we use the large terrain environment database management model to realize the management of the database in the environment. In the process of 3D virtual reproduction of the environment, the 3D scene of the environment is shaped by the Vega driver software. The research found that the environment reproduced by the proposed method is more realistic and intuitive, and interactive operation can be realized. The article has achieved satisfactory results.

Keywords: Computer, artificial intelligence, virtual simulation technology, environmental art.

1. Introduction

The development of environmental art design has become a comprehensive art form that integrates many aspects such as architectural foundation, space feeling and creative thinking. Among the many factors that promote its development, the innovation of design techniques cannot be ignored. The application of pixelated design methods derived from computer graphic art in environmental art design reflects the connection and integration of multiple disciplines, and gradually becomes a unique visual expression of environmental art.

In recent years, environmental art design has been greatly developed in China, and people's requirements for various environmental qualities have increased with the improvement of material living standards. While building material homes, people also call for a spiritual home that can represent their cultural identity. Environmental art is the key to connecting the public and improving the quality of urban culture. Environmental art is defined by the internal and external space environment of architecture. It involves many disciplines and a wide range of design. It covers both indoor and outdoor space elements. Among them, the space combination design of interior, furniture, furnishings and other elements is called Indoor environmental art design; space combination design with elements of architecture, roads, venues, greening, paving, water bodies, sculptures, landscape sketches, etc., is called outdoor environmental art design. Environmental art design is a complex system engineering. It is different from general art creation. It uses scientific and artistic methods to improve and create the environment on the basis of respecting the natural environment and realistic conditions to make it more suitable for people. Various activities and exchanges such as life, work and leisure. Human cognition activities start from feeling. Through feeling, not only can we understand various attributes of objective things, but also feeling is an important basis for consciousness and mental activity, and it is also a direct connection between the human brain and the external world. Starting from human sensory needs, people hope to be able to perform perfectly in an intuitive and visual way, and the application of virtual reality technology can meet this demand of people [1].

Due to the rapid development of core technology, virtual reality technology has been applied to the fields of industrial design, architectural design and environmental art design. The author studies the application of virtual reality technology in environmental art design, in order to make better use of virtual reality technology.

2. Key technologies for the development of environment-based 3D virtual reproduction system

The basic characteristics of virtual reality technology: multi-sensing, immersive, interactive, and conceptual. These features enable the operator to truly enter an interactive three-dimensional virtual environment generated by the computer, interact with it, and communicate. The implementing unit can easily see the problem from the virtual plan and model, and propose amendments or options [2]. This method is not only novel in performance, intuitive, but also simple in operation. Every customer can experience it by himself; in addition, it can also play a very good interactive demonstration for some complex architectural planning, environmental landscape design, interior design, etc. With the decrease in the price of input and output equipment and the improvement of video display quality, coupled with the development of powerful and easy-to-operate application software, the application of virtual reality technology has been rapidly popularized and promoted.

2.1 Edge processing of data

Use the data supplement method as a distance-weighted interpolation method to predict the value of each uncertain point, implement weighted calculation through the known point value of the neighbour, obtain the value of the uncertain point, and obtain the weight given based on the distance:

$$f(x,y)=\left|\Sigma_{i=1}^{n}W(d_i)z_i\right|/\Sigma_{i=1}^{n}W(d_i) \tag{1}$$

In the formula: $W(d_i)$ is the weight function; z_i is the number of i known points; di is the distance between the i point and the uncertain point. Collect the latitude and longitude information of the elevation points of the two-dimensional map, and obtain the gridding result after implementing the Deluanya subdivision of the latitude and longitude (Figure 1) [3]. The gridding result of the latitude and longitude information after the elevation points are filled. Transform the completed environmental geographic data into the DED format supported by Creator, complete the standardized data and curve fitting, and present the latitude and longitude values.

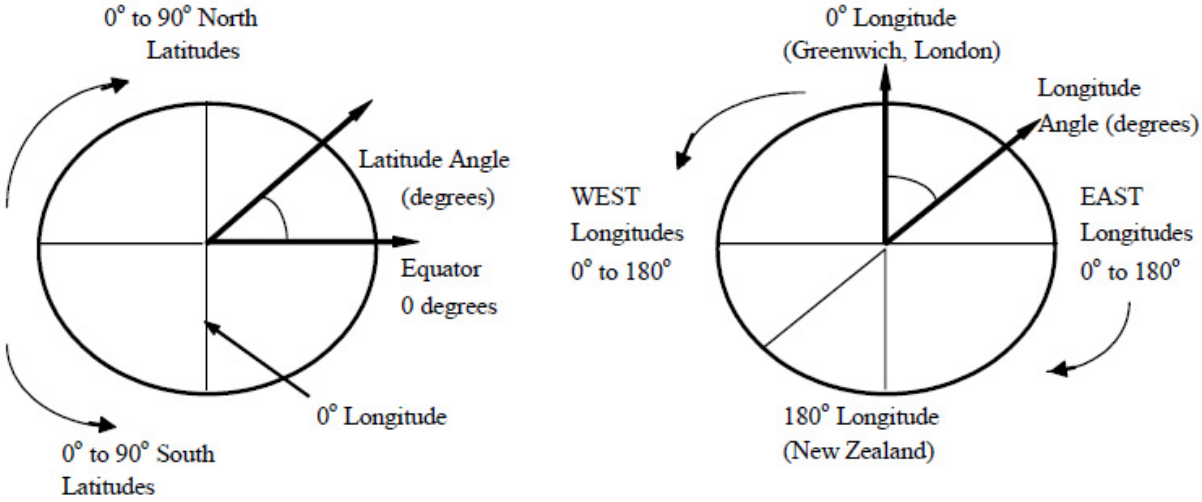


Figure 1. The latitude and longitude information of the elevation point

2.2 Generation of 3D environmental terrain model

The terrain model database of the Creator can be used to shape the environment terrain model database. Based on all feature data with geographic information and attribute information in the environmental terrain model database except for terrain data, the environmental three-dimensional terrain database is shaped, and then virtual environmental terrain is created to ensure that the terrain is close to the actual environment while covering geographic texture features [4]. The Polymesh terrain transformation algorithm in the Creator terrain modeling module is used to obtain the elevation

information and the vertex coordinates of the environmental terrain according to the initial digital elevation data terrain file to obtain the environmental terrain model database. The rectangular grid in the database is composed of uniform triangles. The Polymesh terrain transformation algorithm samples every n elevation points in the original grid terrain database, and n points are related to the density of the grid.

3. Environmental art design three-dimensional virtual system

3.1 Implementation process of 3D virtual VR technology

The specific implementation process of 3D virtual VR technology in urban environment art includes the following steps: When implementing 3D virtual VR on the city's environment, determining the overall design plan is the first priority [5]. After confirming the plan, use the AutoCAD 3D software to view the city in the city. Figure 2 shows the implementation process of 3D virtual VR technology (quoted in A Framework for Using Mobile Based Virtual Reality and Augmented Reality for Experiential Construction Safety Education).

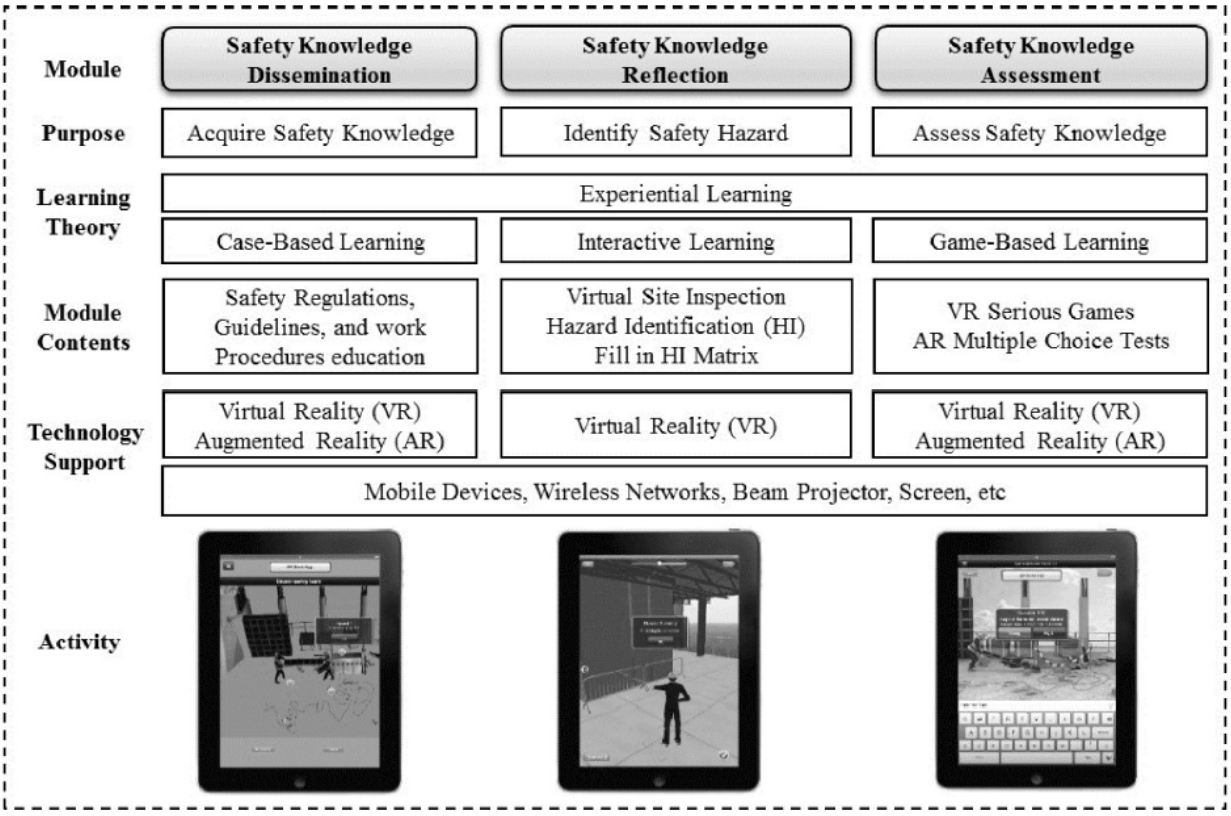


Figure 2. Implementation process of 3D virtual VR technology

3.2 Application in the artistic design of garden environment

Since China's "virtual reality" concept was formally put forward in the late 1980s to the present, great development has been achieved [6]. Compared with traditional environmental art design expression thinking, this technology breaks through the space performance of the virtual environment limited by traditional dimensions, and is a relatively comprehensive design expression system. It does not have to give up a large amount of rich design information for the limitation of the transmission channel, and it can also break through the constraints of the two-dimensional ruler on the form [7]. In theory, almost any type of environmental spatial data can be displayed in the multi-dimensional virtual environment art design. The development direction of virtual reality is very clear: faster and higher quality graphics; cheaper and better designed input and output devices; stronger processing capabilities. These improvements will affect the application of virtual reality in the field of

environmental art design, and will further promote the innovation of environmental art design methodology, the environment and the nature of environmental art design, and the status of environmental artists in environmental design will also be re-discussed. As environmental artists explore the expressive potential of virtual reality, they will become more and more adept at expressing the complexity and subtlety of their experiences, from comprehensive feelings to emotionally rich associations, and the tools and techniques of virtual reality will also get corresponding develop [8].

3.3 Application in the artistic design of urban traffic environment

Economic development has led to a rapid increase in the number of urban vehicles, resulting in huge urban traffic pressure, which not only affects the urban traffic order but also threatens the safety of people's lives and property. The use of 3D virtual VR technology to build an urban traffic environment system is conducive to alleviating urban traffic pressure. 3D virtual VR technology uses various sensing devices to effectively supervise urban roads (Figure 3 shows urban traffic virtual technology, quoted in A Framework for Using Mobile Based) Virtual Reality and Augmented Reality for Experiential Construction Safety Education). The virtual road should be constructed based on the actual traffic conditions at the intersection, and then other reference objects should be used as references to place the traffic lights, traffic conditions, etc. in the appropriate positions; use JavaScript to modify the scripting language for different situations on the road.

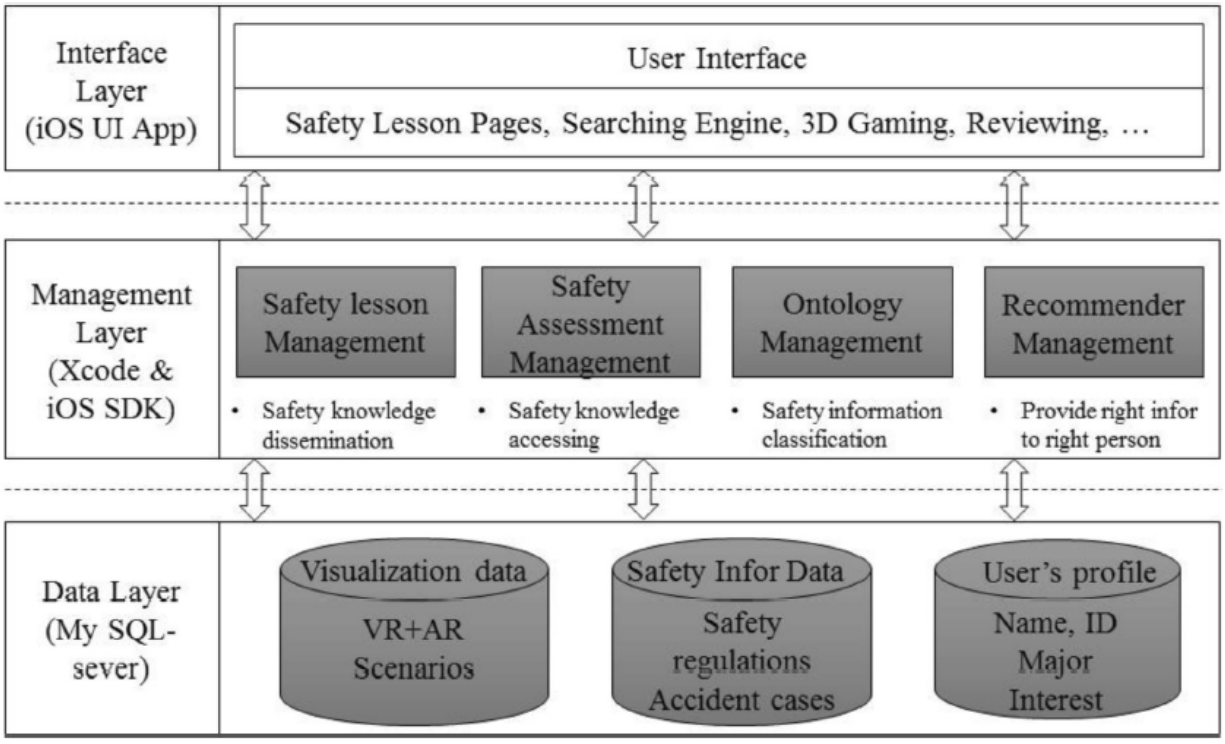


Figure 3. Urban traffic virtual technology

4. System Test

Use Table 1 to describe the different survey results. The use of three-dimensional virtual VR technology in the environmental art design of urban construction projects can improve the accuracy of the cost budget of construction materials and construction frameworks, reduce the large amount of additional expenditures caused by budget errors, and effectively avoid the various problems caused by budget errors. Kind of problem.

Table 1. Improved environmental art design scoring results

No	Intuitive feeling	Simplicity	Environmental protection	Practicality	Implement ability
1	93.36	91.86	93.39	94.11	93.36
2	96.27	93.16	94.08	91.02	93.16
3	95.17	92.37	96.07	93.42	96.07
4	94.19	90.29	97.65	94.12	93.56
5	92.86	93.56	98.15	93.42	89.55
6	94.86	92.26	93.44	91.83	94.03
7	96.27	89.55	95.14	95.23	94.32
8	95.49	94.03	94.32	94.64	94.47
9	94.28	94.42	93.5	95.05	93.97
10	93.73	91.72	94.47	93.97	93.42
Average value	94.65	92.32	95.02	93.69	93.61

5. Conclusion

Virtual reality technology breaks the limitations of traditional environmental art graphic design by allowing designers to plunge into a more realistic virtual three-dimensional environment, and provides designers with multiple design angles to better analyse the relevant aspects in modern environmental design. The proportions and relationships of the elements. This paper studies the application of 3D virtual VR technology in environmental art design, analyses the specific implementation process of 3D virtual VR technology, and constructs a 3D model of the urban environment to enhance the realism of environmental art design.

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