Dynamic Request Scheduling Algorithm and Realization of Virtual Landscape Architecture for Multi- Core Web Server

Dr.Omkar Patnayak
BP University
Odisa, India
Email: omkar29in@gmail.com

Dr.K Balamurali Koliyan
Department of CSE
Annamalai University, India
Email: jkbalamurali@gmail.com

Abstract

Virtual reality technology in the application of landscape architecture design is not yet mature, and many aspects are in the initial stage. As a very promising technology, Virtual reality technology has brought challenges to people's lives, and also brought great opportunities. As the basis of virtual reality technology, 3D is always the essence of the landscape architecture design. Compared to the traditional manual design, it has to make the design process more scientific and provide a better design display effect. The purpose of this paper is to enhance people's cognition of environmental space through designing strategy application and research of 3D virtual reality of landscape architecture, and combining the design of landscape architecture with digital modeling. 3D virtual reality can be used to deal with complex information, provide a good social environment for the design and construction of the physical environment, and bitterly apply the culture into the design .Of course, we can also effectively help the landscape architecture design, taking advantage of computer design efficiency and convenience to help or replace the human brain thinking and design, thus make the landscape architecture design more scientific and reasonable.

1. Introduction

Literature review as a design tool, virtual reality displays the designer's meaning with a more intuitionistic visual form, changing the way of understanding the drawing which only using two-dimensional drawings and relying on imagination. Virtual reality technology transforms two-dimensional data into three-dimensional data and converts the designer's meaning into space scenes, which has greatly improved the efficiency of the design, so that designers during the design process can change at any time when they are not satisfied, and has reduced the modification time. There are mainly three methods to realize virtual reality technology. First, to realize through direct programming,

such as VRM L, C + +, Delphi, etc.; Second, to realize OpenGL graphics library programming and modeling through adding real-time and interactive features of these two modules at the same time; third, to realize directly through the modeling software and virtual reality software, such as Vitriols, Cult3D, Quest3D, Multigene Vega, etc.. The third method is EON, Vitriols, Quest3D, with its advantages of powerful, clear picture quality, fast loading being widely used [1]. This paper will review the progress of research at home and abroad, analyze the shortages of this research, and put forward to some specific related issues.

1.1 3D-based Virtual Reality Technology

Virtual reality has the characteristics of immersion, which can make people immersed in the virtual space or the scene created by the computer, and people can become participants from spectators. With the help of virtual simulation technology, participants can be immersive, and better perceive the surrounding scene. With the rapid development of information, 3D design is of great significance for the design and development of landscape architecture, which also makes the landscape architecture design strengthen the digital application. Landscape 3D digital design of the application can well establish a digital design process, so as to promote the construction and development of landscape architecture. [2]

1.2   Introduction to Virtual Reality Technology System Development

The system is developed in cooperation with the professional landscape architecture design units, and it fully demonstrates the designers' various functions of the demand for contemporary computer-aided design to develop targeted professional functions, so that it is different from other domestic systems: More professional vegetation design and more professional drawings design. In the landscape architecture design planning, we take the traditional design of as main parameters, supplemented by 3D virtual reality design method [3].

Certainly, the program should also use technology, and good technology can complete the design in a better way. In the design, we must firstly carry out parametric analysis, and construct the parametric model, which lay a preliminary foundation for the virtual garden landscape construction. Meanwhile, this program has also adopted the design process of the parametric model construction method. In the parameter model construction, we should establish the corresponding computer model, so as to change the value of the parameters, and control the landscape architecture, the whole digital design part and details. And during the process of the virtual landscape parameter model construction, we should employ some professional designers, which are conducive to improving the model. At the same time, we also pay attention to the change of space in order to better maintain the balance of virtual landscape and reality.

2. Literature Survey

2.1   Introduction to 3D Technology

3D is the abbreviation of 3D MAX. This software can complete the task that only be able to work in the workstation through transferring to the personal computer. It can build models in terms of the landscape architecture design. 3D landscape architecture design system is a CAD system [4]. It is

powerful and it can help designers to complete the previous program design, medium-term program modification and the late program show. The advantages of 3D graphics lie in its precision, elegant appearance, fast speed, high efficiency, and it is easy to modify, save, send and update, and paper-free operating system. It mainly takes the landscape architecture design as the goal, and the terrain design, environmental planning, vegetation design, road construction design as a supplement. Firstly, the system demonstrates its graphic design, then completes its 3D scene rendering through OPENGL dynamic browsing to the scene, and demonstrates multi-directional aspect. The system flow is shown in Figure 1 below. At the same time it is also a powerful engine, and can be divided into three parts: editor, browser and SDK [5].
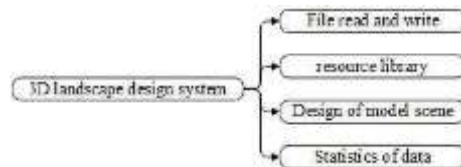

Fig.1 3D landscape design system

2.2   3D Technology Involved In Virtual Landscape Architecture Design

3D virtual technology has a high cost performance, which provides excellent functionality compared with its own price. Compared with other software, it can operate on a personal computer, and reduce the cost of production [6]. It is convenient and easy to use, making beginners spend a small amount of time to master. Its production process is quick and easy, the operation method is clear, which is conducive to simplifying the work needed by the design, and shortening the time required. It is widely used and it is beneficial for communication. At present, there are more and more individual or corporate groups using 3D virtual reality technology design in the world, which is conducive to the exchange of business-to business and people-to-people, and there are many colorful plug-ins and maps.

Fig.2 3D technology involved in virtual landscape design

3 Drawing Process

The mapping process 3D-based virtual landscape architecture design system can be generally divided

into: mathematical modeling stage, rendering stage, material selection stage, post-processing stage. Among that, the landscape architecture design has many elements such as terrain, water, landscape architecture, plants and so on.

3.1 Modeling Phase

We will divide mathematical modeling into three steps: the preparation of this stage is the stage of data preparation, collecting information needed. The common resources are texture mapping, CAD drawings and other information [7]. The mid-term stage is mathematical modeling operations. After the pre-preparation work is fully completed, the second step can be carried out. For different elements of the modeling, there are different ways [16]. In general, the modeling can be divided into two parts. The natural part mainly includes terrain, vegetation, water modeling, and artificial landscape. The artificial landscape part is mainly the construction and other artificial component. The third stage is post-synthesis and output. After completing the creation of the elements, they need to be synthesized together. In order to meet the purpose of landscape modeling, it needs to set the final effect [8].
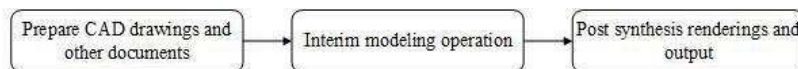

Fig. 3 3D modeling flow chart

3.2 Rendering Phase

In the coloring process similar to manual drawing of the two-dimensional model, we should distinguish the bright and shade relationship between objects to reflect its texture in the two- dimensional drawing. Rendering process can be reflected through the "light", and the model material can show the texture required. 3D MAX can track through light and shadow, and it can show a variety of light and dark relationship through the production [9].

In the 3D technology, the use of system software can assign it with model material. For different models, we must carefully select the different materials to achieve lifelike effect. Post-processing is process that needs constantly modification. There are still many blank places needed to be filled through post-processing because of the rendering of the perspective drawing. For the design of the landscape architecture, this part is the most important part, which is directly related to the effect of final map [10].

Topographic analysis principle about the aspect, and slope: taking the DTM square plane as a basis for calculation. Aspect is the projection of the plane perpendicular in the horizontal plane. Slope is the angle between the plane and the horizontal direction. Slope calculation: the height of the aspect and the slope is divided by the vector value of the horizontal direction.
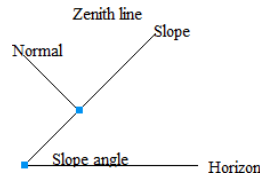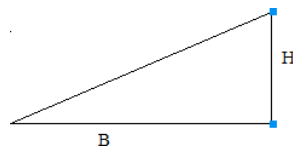
Fig. 4 Figure calculation

Fig. 5 Figure calculation

4 The Application of 3D Virtual Reality Technology in Landscape architecture design

4.1 Use of 3D Technology in the Landscape Architecture

Landscape architecture design has a very high requirement for environment, so you start to need imagine the environmental changes after the completion. Sand table, three-dimensional renderings, roaming animation is common display ways of the designer. But these methods have their own shortcomings, having a common shortcoming that is lack of immersive experience, so that the use of 3D virtual reality technology can make this up [11]. After using 3D virtual reality technology, we can see the specific design results, vicariously understanding the surrounding environment and understand the designer's intent, which is unparalleled compared with the traditional technology.

4.2 The Bottleneck of 3d Virtual Reality Technology in Landscape Architecture Design

The constructed model is composed of the surface, and the number of faces used is proportional to the difficulty of the model shape. Today, some relatively mature areas using 3D virtual reality technology - urban planning and architectural design. The building needs a relatively small surface in the computer modeling, so it is easy to achieve. Some models such as plants, transformative terrain, water, etc. in landscape architecture are made up of the irregular surfaces, which are commonly used because computer model is very complex and computer models needs millions of surfaces, which cannot perfect match with the computer in the current stage [12].

4.3 The Current Solutions

At present, the computer can only support the use of textures to construct 3D virtual reality scenes. And the special map when modeling is used to solve such problems. Although using the texture will have a certain degree damage to the authenticity, we can only choose this approach for the modeling

requires millions of surfaces. At present, many countries have used 3D virtual reality technology in many places such as 3D virtual tour, achieving to travel for thousands of miles afar. Based on the reality of the landscape, the use of 3D virtual technology creates a virtual scene through the virtual platform simulation or restoring the reality of the landscape. Its image is authentic and the environment is relatively real, which bring the visitors a great pleasure in the tourism experience [13].

The vision of 3D virtual tourism can become a reality depending on the continuous development of virtual technology. 3D platform can display the scenic spots of landscape on the computer through the 3D virtual reality technology to enable tourists to travel online. Shanghai World Expo has also used the 3D virtual reality system, and it shows the uniqueness of this system to people [14]. To realize the landscape system through 3D virtual technology, we should firstly find out the material and its establishment methods, and then develop the landscape system program, and establish the landscape scene, the plants, water model, what's more, set up the properties of the camera. Secondly, we import this scene, and set up the sound, as well as the garden plants and water body location. The last is the release of landscape works. Every single details should be seriously completed with a rigorous attitude, and continue to improve it. The import of 3D technology must consider importing low-precision model, in line with the Q3D virtual scene production requirements. Of course, there are some drawbacks in the landscape 3D virtual design. People are too dependent on computer design, and 3D virtual method application will replace the human brain design and application, which cannot enable people to create new ideas and thinking, and people's thinking logic cannot break through the existing achievements, and reach a higher area. At the same time, the landscape architecture design of 3D virtual landscape will make the landscape architecture design too digitized, mechanized, lack human spirituality and sensibility, so that cannot better give the soul of landscape architecture. The digital application replaces the thinking of the human brain, which will make the human become lazy, and will make people lose their rational thinking. In this way, it will destroy the development law of things which is not conducive to the development of landscape architecture design and the long-term development of 3D virtual reality technology. And the landscape architecture design will be lack of innovation.

Table 1 Distribution of scores in sample compositions

Score	7	8	9	10	11	12	Total
Training set	24	28	40	35	31	26	184
Test set	4	8	12	11	6	5	46
Total	28	36	52	46	37	31	230

Furthermore, architecture with different scores was compared to different categories used in this automatic composition scoring system. And the feature values of samples used in this study were selected and classified by feature selection method. The distribution of the feature values of all samples is shown in figure 6. The results show that the distribution of all feature values is within the

reasonable range of requirement, which can be applied to subsequent scoring accuracy research.
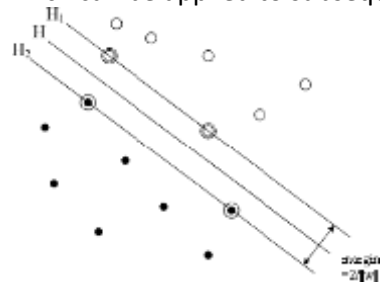

Fig. 6 The distribution of sample feature values based on feature selection methods in the distribution line

In order to further analyze the accuracy of the final automatic scoring system for compositions, the analysis results are shown in figure 6. In this study, firstly, three different feature selection methods (Method A: CHI, method B: IF-IDF, and method C: IG) were chosen as the main methods to extract the main feature values in this case study. Then, under different feature selection methods, the accuracy of the scoring system for compositions with different eigenvalues was analyzed [15, 16]. The results show that the accuracy of the automatic scoring system for compositions varies with different feature selection methods. In this study, the best feature selection method is IG feature selection method [17,18]. It is also found that the accuracy of the final automatic scoring system varies with the number of feature values. When the number of feature values is 10-15, these three feature selection methods all show high accuracy. Therefore, when feature selection methods are used, the optimum number of feature values is in the range of 10-15.
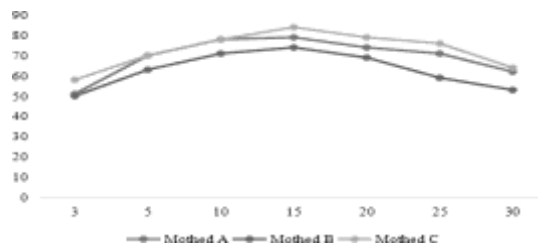

Fig. 7 Comparison of the accuracy of automatic scoring systems for architecture underdifferent feature selection methods

Finally, the automatic scoring system for composition based on the feature selection method was compared with the traditional automatic scoring system for composition in terms of scoring efficiency, scoring accuracy and resource utilization. The result is shown in figure 5. The results show that the automatic scoring system for compositions based on feature selection has high advantages, which can be applied to the subsequent automatic scoring of compositions.
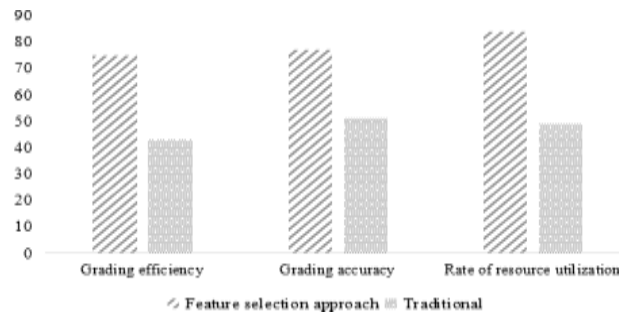
Fig. 8 Comparison and analysis of the automatic scoring system for architecture basedon the feature selection method and the traditional automatic scoring system

5. Conclusion

Therefore, the design of landscape 3D virtual reality has its merits and demerits. The application of 3D virtual reality design of landscape architecture is of great significance to the design of landscape architecture. However, it needs to be used wisely; otherwise it will become a factor threatening human thought. Nowadays, in the rapid development of information, the development of landscape architecture and 3D virtual reality design should be closely integrated, so as to better promote the construction of landscape architecture. By studying the development and practice of 3D virtual reality technology in landscape architecture and the steps of traditional landscape architecture design, it is found that the combination of 3D virtual reality and landscape architecture design is becoming increasingly integrated. At present, 3D virtual reality technology has a great potential for development. The feature selection method, as a new theory that has been mentioned and introduced in the automatic scoring system for compositions, may have positive influence and practical value on the perfection of the final evaluation result of the automatic scoring system. In view of the advantages of this evaluation method, the effective combination of feature selection method and automatic scoring system of composition was analyzed and discussed in this paper, so as to provide a theoretical support for the establishment and development of a more perfect scoring system, and provide some reference value and practical significance for the cognition of college students to their proficiency and the continuous improvement of the national teaching model. Therefore, in view of a series of discordant phenomena described above, in this study, the advantages and characteristics of the scoring system were analyzed, and the feature selection method was further introduced, so as to provide a theoretical basis and reference for the solution of the related problems in the process of system development

References

[1]   Kumar G N, Arokiasamy A. (2015), An efficient combined call admission control and scheduling algorithm to improve quality of service for multimedia services over next generation wireless networks. Journal of Computer Science, 11(2). 416-425.

[2]   Devi K N, Tamilarasi A. (2015), Dynamic Scheduling in Grid Environent with the Improvement of Fault Tolerant Level. Indian Journal of Science & Technology, 8(S8). 507.

[3]   Stanisic L, Thibault S, Legrand A. (2015), Faithful performance prediction of a dynamic task — based runtime system for heterogeneous multi — core architectures. Concurrency & Computation Practice & Experience, 27(16). 4075-4090.

[4]   Kwon K, Park H, Jung S. (2016), Dynamic Scheduling Method for Cooperative Resource Sharing in Mobile Cloud Computing Environments. Ksii Transactions on Internet & Information Systems, 10(2). 484-503.

[5]   Zeng L, Wang Y, Feng D. (2015), XCollOpts: A Novel Improvement of Network Virtualizations in Xen for I/O-Latency Sensitive Applications on Multicores. IEEE Transactions on Network & Service Management, 12(2). 1-1.

[6]   Li L, Chen L. (2015), Study on a New Heterogeneous Multi-core Hardware/Software Partitioning Method. International Journal of Multimedia & Ubiquitous Engineering, 10(4). 251-258.

[7]   L.Sharmila, U.Sakthi "Analysis on various search algorithms", Global Journal of Pure and Applied Mathematics, Volume 12, Number 2 (2016), pp. 1397-1402.

[8]   Guo D, Wen Q, Li W. (2015), Analysis and Improvement of 'Chaotic Map Based Mobile Dynamic ID Authenticated Key Agreement Scheme'. Wireless Personal Communications, 83(1). 35-48.

[9]   Moulahi T, Guyennet H, Nasri S. Improvement of RDS-MPR by A Cluster-Based Energy- Efficient Broadcasting Algorithm for Dynamic WSNs. Ad Hoc & Sensor Wireless Networks, 2015, 25(3-4):223-240.

[10] L.Sharmila, U.Sakthi, "Search Algorithm for Multiple Histories Using Time-Sorted Array", Journal of Computational and Theoretical Nanoscience, Vol. 15, No. 9/10, pp. 2917–2919 (2018), ISSN: 1546-1955.

[11] Moon J, Choi Y, Jung J. (2015), An Improvement of Robust Biometrics-Based Authentication and Key Agreement Scheme for Multi-Server Environments Using Smart Cards. Plos One, 10(12). e0145263.

[12] Wang J, Bao W, Zhu X. (2015), FESTAL: Fault-Tolerant Elastic Scheduling Algorithm for Real- Time Tasks in Virtualized Clouds. IEEE Transactions on Computers, 64(9). 2545-2558.

[13] Michael Fiechter, Jelena R. Ghadri, Michèle Sidler. (2012), Cardiac quadruple-fusion imaging: A brief report on a novel integrated multimodality approach for in vivo visualization of transplanted stem cells. International Journal of Cardiology, 161(1).

[14] Hyun-Wook Kim, Namkug Kim, Ki Woo Kim. (2013), Three-Dimensional Imaging of Cerebellar Mossy Fiber Rosettes by Ion-Abrasion Scanning Electron Microscopy. Microscopy and Microanalysis, 19(S5).

[15] Elaine Sullivan. (2016), Potential Pasts: Taking A Humanistic Approach To Computer Visualization Of Ancient Landscapes. Bulletin of the Institute of Classical Studies, 59(2).

[16] Megan Joyce. (2012), Constructing Nature: Art, Conservation, and Applied Zooarchaeology. Journal of Ethnobiology, 32(2).

[17] Magdolna Eva Koncsag, Ioana Maria Man. (2015), The Integration Of CAD Instruments And Databases For The Historical Monuments Records In The Area Of Bighi, Malta. Journal of Applied Engineering Sciences, 5(2).

[18] Michael James Harrower, Kathleen M. O'Meara, Joseph J. Basile. (2014), If a picture is worth a thousand words. 3D modelling of a Bronze Age tower in Oman. World Archaeology, 46