Application of computer virtual simulation technology in 3D animation production

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Abstract. In the continuous development of computer technology, the application system of virtual simulation technology has been further optimized and improved. It also has been widely used in various fields of social development, such as city construction, interior design, industrial simulation and tourism teaching etc. This paper mainly introduces the virtual simulation technology used in 3D animation. Based on analyzing the characteristics of virtual simulation technology, the application ways and means of this technology in 3D animation are researched. The purpose is to provide certain reference for the 3D effect promotion days after.

1. Introduction

The progress of science and technology has made the development of 3D animation technology advance by leaps and bounds, and the three-dimensional animation presented is gradually mature and perfect. At present, many small and medium-sized enterprises in the dissemination of corporate culture and service concept will choose three-dimensional animation as the main carrier. The main reason is that 3D animation can perfectly display the desired effects and achieve satisfactory results [1]. Therefore, the scope of application of three-dimensional animation is expanding. The 3D animation involves computer virtual technology, as one of the important techniques of 3D animation technology, can not only enhance the sensory effect, and the construction is of great significance for the success of the virtual environment [2]. Therefore, it is very important to study the application of computer virtual simulation technology in 3D animation, which needs to be paid more attention to.

The definition of virtual simulation technology from two aspects of narrow sense and broad sense of understanding and analysis, virtual simulation technology mainly refers to the narrow sense with the development of computer technology and network technology. It is a kind of quasi experimental technology, using this technology can realize the full construction of virtual space [3]. The virtual simulation technology is applied to the generalized is always human understanding of the world, exploring the nature of the process, especially in the development of computer technology and network technology, virtual simulation technology is self-contained, with a mathematical model and a simple simulator for the entities, real characteristics in the virtual environment in the objective world fully reflected [4].

2. Application principle of 3D virtual technology

The 3D virtual technology is also called virtual simulation technology. This technology is mainly dependent on computer technology, and on this basis with other devices in the virtual environment interaction and mutual influence and the relevant factors, in order to get similar experience and feel real.
2.1 Real time display technology based on 3D graphics
At present, three dimensional graphics display technology is relatively mature, and the key to the current application is how to implement real-time display [5]. Generally speaking, in order to ensure that can generate 3D geometry in the shortest time, graphic refresh rate will not be less than 15 frames per second, which requires the image texture, shadows and illumination will meet the requirements of. Therefore, a scientific and effective method is adopted to reduce the scene complexity.

Two methods are commonly used, one is scene segmentation. This method mainly divides a complicated scene into several modules. When a scene is displayed, other scenes are in invisible state. As a result, the scene complexity can be reduced [6]. The other is visible blanking. This method mainly refers to the system only shows the user can see the scene, and different block methods. This method is mainly from the user perspective, through the effective conversion of visible facets and cannot meet the transfer of different scenarios to the user.

2.2 Interactive technology in virtual simulation
Interactive technology is mainly in the virtual system, the user through the operator interface to perform a task as a means, the user through the control behaviour to complete the virtual environment changes in the various factors. At present, the interaction technology in virtual simulation is divided into three types, namely, direct user interaction technology, physical control technology and virtual control technology.

Among them, the direct user interaction technology mainly refers to the direct mapping of user action in the reality to the virtual environment. The advantages of this approach are that the virtual environment can be visually displayed, with strong flexibility. Physical control technology relies mainly on some operating devices, such as the mouse, keyboard and so on, through the operation of these devices to complete the interaction with the virtual environment.

2.3 The establishment of 3D virtual simulation system
The establishment of 3D virtual simulation system is a comprehensive and systematic work. The system can be roughly divided into two parts as follow.

2.3.1 Establishment of 3D scene database. In the virtual environment, in order to ensure the logical relationship between interactive and real-time 3D performance remained stable, while ensuring that the elements in the environment can quickly respond to the control behaviour, the designers build model should be used in real-time 3D visual database modelling and optimization tool platform combination. At the beginning of the modelling process can be accomplished using common modelling tools, then based on the 3D scene database description of complex scenes, this stage can be used to roam path establishment, LOD setting and 3D model of hierarchical data storage technology.

2.3.2 Development of 3D visual management system. This part of the work mainly includes two aspects; first of all, the use of the underlying three-dimensional graphics development library, currently more commonly used DirectX and OpenGL two. The application of these two development libraries requires users to fully understand and master the principles of 3D transformation, 3D coordinate, light and viewpoint, and at the same time master the operation flow of design, coding and so on.

3. Application of computer virtual simulation technology
Many, including computer virtual simulation technology such as graphic design, virtual reality technology, simulation technology and multimedia interactive design technology, these technologies have played an irreplaceable role in 3D animation. Only by combining these technologies effectively can we get the best 3D animation effect and realize the reality and the virtual scene.

3.1 3D animation modelling
Three dimensional animation modelling is the basis of 3D animation, and also the first step of animation production. The animation of this stage mainly includes two aspects, namely, animation
scene model production and animation character model making. The animation modelling technology mainly based on virtual reality simulation technology, compared with the traditional simulation technology, virtual reality simulation technology with more animation imitation and human-computer interaction in the practical application process, in order to better animation figures, flexibility.

In the specific design, the designers need to collect and sort out the related materials of animation characters and scenes, and also do a comprehensive analysis of the relevant CAD drawings and the graphic image data. If the content of animation scene model related with the buildings and the landscape animation staff also need to collect some related aerial pictures, through the true picture of the data to determine the reasonable elements in the virtual scene, to provide more information to be effective application of simulation technology for virtual reality mode, but also can to further enhance the effect of making 3D animation.

3.2 Application in 3D animation
With the development of 3D animation application in recent years, computer virtual simulation technology has been paid great attention to as an important technology of 3D animation. At present, the application of computer virtual simulation technology has covered the aerospace industry, the construction engineering industry and the military field. The production of three-dimensional animation of virtual simulation technology using computer can happen in the future to build the scene in the virtual environment, and find out the possible problems and formulate corresponding measures, the development of the various areas all have a role in promoting.

3.2.1 Construction field. At the present stage Chinese, 3D technology has been widely used in the field of Construction: the construction of early 3D animation because of technical limitations and creative production on the single, making the building of the running animation is simply building the camera animation, as shown in Fig.1. With the diversification of 3D technology and creative techniques, building animation from script creation to sophisticated modelling, the late film editing techniques, as well as original music and sound, emotional performance style approach, making a comprehensive architectural animation increasingly high standards, building animation costs a lot lower than before.

3.2.2 Planning domain. Roads, bridges, tunnels, bridges, streets, night, attractions, city planning, city image display, digital city, virtual city, digital city park planning, engineering, construction, airports, stations, parks, squares, kiosks, post offices, banks, hospitals, schools, the construction of digital campus animation, as shown in Fig.2.

3.2.3 Product demo. The main function of 3D animation is to simulate and display the desired effect by animation. For example, in the construction of digital cities, the applications in different fields are different. How can we introduce the results of digital cities to visitors? Then we need to make a three-dimensional animation, and restore the reality through animation, so that visitors can understand the application of this technology more intuitively, as shown in Fig.3.

3.2.4 Title animation. Titles, animation, creative production, such as promotional films, animation titles, game titles, animation, television titles animation, film titles animation, animation titles, product demonstrations, animation titles, advertising titles, animation, etc. as shown in Fig.4.
4. Conclusion

With the rapid development of 3D animation, the application of computer virtual simulation technology in this field will be highly valued. From the analysis, we can see that the application of virtual simulation technology to 3D animation, can not only abstract things concrete and clear, but also can make the animation scenes and characters more vivid and lifelike, improve the visual impact of the sense of animation works.

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