Research on 3D Animation Scene Design Based on Virtual Reality Technology

Luo Juanjuan

Lingnan Institute of Technology, Guangzhou, Guangdong, China

Keywords: Three-dimensional animation, Scene optimization, Virtual reality, Design and Application.

Abstract: Three-dimensional animation brings users a new experience of watching movies in a new way of expression, and virtual reality technology is needed in its production process. In order to effectively improve the quality of 3D animation scene production, we need to actively adopt advanced animation technology, and actively introduce virtual reality technology to enhance the performance of 3D animation. Therefore, this paper takes the intrinsic relationship between virtual reality technology and three-dimensional animation scene production as the basic theory, analyses the role of three-dimensional animation scene after introducing virtual reality technology, and finally puts forward concrete countermeasures from three aspects of application principle, practice process and application points, hoping to provide some experience for three-dimensional animation production.

1. Research background

1.1 Literature review

Three-dimensional animation and virtual reality technology occupy an important position in image and three-dimensional graphics technology. These two technologies have real-time, interactive advantages, and are a high-end technology to reappear the imaginary world. Among them, three-dimensional animation technology has become the key means of game production and film and television creation (Zhao, 2018). For example, the rapid development of three-dimensional animation technology, such as animation capture system, has had a tremendous impact on traditional animation technology. Virtual reality technology is an interactive technology, which is mainly used in many aspects of simulation scenarios, such as urban planning, flight training and so on (Wang, et al, 2011). In this context, many literatures began to discuss the theory of virtual reality technology and three-dimensional animation scene design. In view of the problem that the current 3D animation scenes can not be fully acquired, some literatures put forward specific plans of 3D animation scene graphic design based on virtual reality technology. In this scheme, the camera coordinates are transformed to the world coordinates to form the depth coordinates of the mesh nodes in animated scenes (Li, 2017). The author validates the 3D animation scene model with virtual reality technology, and finds that the above scheme can effectively improve the accuracy and stability of 3D animation scene construction (Yao, et al, 2013). Some scholars have proposed that virtual technology, combined with integration technology in many fields, has been deeply studied in industrial simulation, real estate development, cultural dissemination and other fields. Relatively speaking, entertainment is mainly based on virtual reality games, such as VR animation Pearl is a new form of expression. The integration of interactive 3D animation into VR scenes will bring new feelings to the experiencer (Hong, et al, 2012). Some scholars point out that the rapid development of computer hardware has brought about great changes in virtual reality technology and three-dimensional animation. Current TV dramas, movies or online games are using three-dimensional animation technology to set off realistic scenes, and are greatly welcomed (Li, et al, 2015).

1.2 Purposes of research

In the field of three-dimensional animation scene production, the application of virtual

technology has become a mainstream trend. In order to optimize the quality of animation creation, technicians will use virtual reality technology to produce animation content. The technology application system formed by the simulation of three-dimensional animation scene by virtual system has been widely used in the field of animation creation. Among them, realistic pictures can attract more audiences. In the current era, people have realized the importance of virtual reality in the production of three-dimensional animation, and began to increase the learning and application of modern technology. In order to bring more perceptual experience to many audiences, it is necessary to integrate virtual reality technology and three-dimensional animation scene production effectively, and use new technology to improve the picture to the best level; further use of technical means to enhance interaction, while integrating graphic design, virtual simulation and other technologies to produce the best three-dimensional animation scene works.

2. The relationship between virtual reality technology and three-dimensional animation scene production

Virtual reality technology is based on computer. It integrates virtual, illusory and other perceptual experiences, and brings people new feelings. In the real application process, virtual reality devices rely on headphones, glasses and other devices to achieve, and through the combination of physical space, the experience is stronger (Wang, et al, 2017). On the basis of modern computer equipment, virtual reality technology can stimulate users'sense organs such as vision and hearing in the best way, thus realizing special interaction. With the continuous optimization of three-dimensional animation scene, it establishes an intrinsic specific relationship with virtual technology, as shown in Figure 1.

Virtual technology presents a three-dimensional model in the virtual world, which can form a three-dimensional animation effect with the help of computer network. Virtual reality technology has a strong connection with the process of computer animation production, and the similarity is very high. The common point between them is to realize the free interaction of actions based on the standard of three-dimensional graphics technology. At the same time, the continuous innovation and optimization of three-dimensional animation technology can further upgrade the traditional virtual reality technology. Generally speaking, virtual technology interaction links mainly emphasize the integration of Internet and three-dimensional graphics technology, and form the best animation content on this basis. Therefore, the production of three-dimensional animation scenes can not be separated from the realization of virtual technology, which pays special attention to the performance of animation creation art and can show more real virtual scenes.
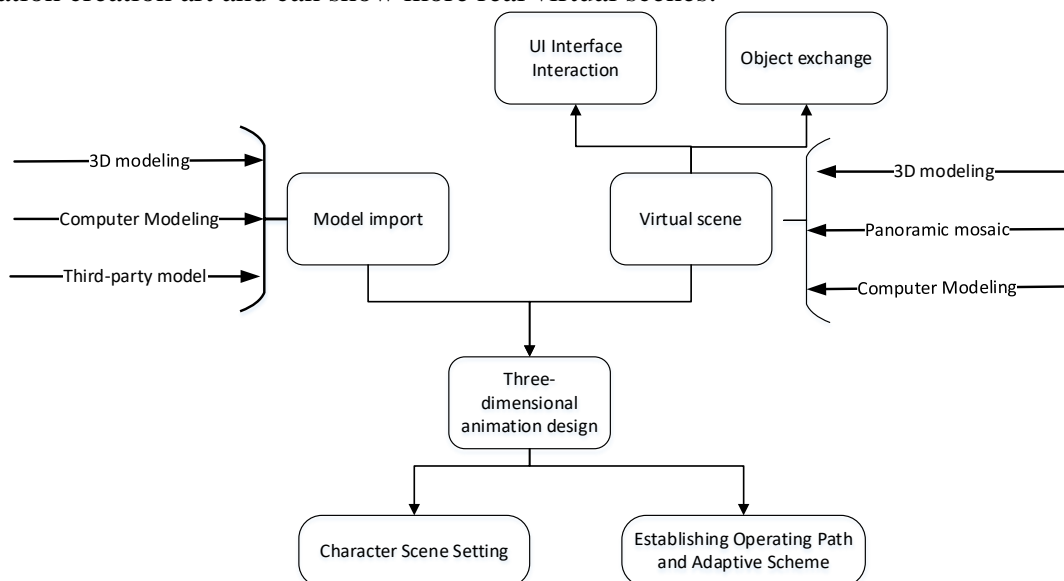
Figure 1. The Relationship between 3D Animation Scene Design and Virtual Technology

3. The role of virtual reality technology in three-dimensional animation scene

3.1 Virtual reality technology can realize the transformation of image vision

From the early development of animation, they all exist in the form of 2D and 3D. As a result, user space experience has been greatly limited. With the continuous improvement of information technology, animation forms are more abundant (Pu and Xu, 2004). When the three-dimensional animation scene appears, people can use virtual reality technology to show it and provide the real space world for the audience. On this basis, users can interact in real time, satisfy their own visual experience, stereo the plane image, and finally meet the needs of reality.

3.2 Subverting the traditional concept of animation production

In traditional animation production, people need to use both hands to depict the whole image motion process, and finally use the camera keys to shoot these pictures, and then in the later stage to wash, edit and so on. In this process, the process is more cumbersome and labor consumption is relatively large. However, when the three-dimensional animation scene appears, technicians take pictures through computer animation, and use virtual technology to optimize and restore, thus converting vision from plane to three-dimensional state. In this state, the three-dimensional animation scene ensures 360 degree animation without dead angle through virtual reality technology, and shows a more three-dimensional image.

3.3 It can display the advantages of practical application efficiently

Virtual reality technology needs to rely on head-mounted display devices for display. As an important bridge of virtual reality technology, VR spectacles can simulate the real content and are the key tools for human-computer interaction. At present, there are two kinds of VR glasses produced by traditional three-dimensional animation, namely desktop version and mobile version, that is, network system and collection system. Comparatively speaking, under the new situation, VR glasses have the advantages of interaction, and other tasks can be accomplished only by cooperating with the action of the host computer.

4. Application practice of virtual reality technology in the process of three-dimensional animation production

4.1 Application principle

In the process of making three-dimensional animation scene, virtual technology is based on real-time display technology, forming three-dimensional graphics in the shortest time, and then ensuring the real-time display of the screen. In the process of production, technicians can reduce the complex screen problems caused by various scenes, and users can experience different screen contents through real-time conversion. At the same time, audiences interact with virtual technology through various screen operations. In reality, virtual technology maps animated pictures to virtual environments to reflect the real content of three-dimensional animated scenes. In situational environment, people use various wearing devices to experience and roam in three-dimensional animation scenes. In addition, in the process of making three-dimensional animation scenes, technicians will analyze and integrate three-dimensional data to form virtual interactive links. Therefore, correctly handling the relationship between modern technology and three-dimensional animation and optimizing virtual reality technology in various environments can effectively promote human-computer activities and improve cognitive level.

4.2 Practice process

In order to ensure the best effect of three-dimensional animation scene, we need to use virtual reality technology, combined with professional technology and comprehensive ability to create a complete model. On this basis, further optimization is carried out. Firstly, animation scenes and character models are made to create a virtual environment with high fidelity through modern technology. When using virtual technology, we need to pay attention to animation simulation and

technology research. According to the existing work experience and professional animation production technology, many people realize the natural and smooth transformation between multiple pictures. Secondly, according to the characters and animation materials, integrate other materials in the model. At the same time, it also needs aerial photography related resources to obtain more accurate data through aerial photography. Then, according to these data, the key points of virtual reality technology application are determined in time. Finally, on the basis of retaining the original object, a three-dimensional model is constructed. In other words, staff can use virtual reality technology to achieve animation flexibility. In the whole process of modeling, real-time scanning of relevant deviation, preserving the information of three-dimensional data, thus providing effective guidance for animation management.

4.3 Application points

In real life, virtual reality technology enables users to have a new experience, especially in the context of the link, the degree of virtualization allows users to actively participate in it, thus forming a good psychological feeling. Generally speaking, three-dimensional animation scene production will have a strong sense of visual art and perception art. At the same time, multimedia technology also has a strong impact on three-dimensional animation. In the process of making three-dimensional animation scene, people need to play the role of virtual reality technology and get the best experience according to the production of interactive environment. In the experience of space sense, people and space need to be fully practiced to blur the boundary between virtual and real world. In the construction of the model, the staff should study the content of the three-dimensional animation scene production, understand the knowledge related to the animation image, and integrate the relevant resources. In addition, in the practice of three-dimensional animation production, according to the actual situation, adjust the application scheme of virtual reality technology, summarize work experience and collect relevant data in time, so as to promote the wide application of virtual reality technology.

References

[1] Zhao W. (2018). Three-Dimensional Design of Animation Characters Based on VR Technology. Modern electronic technology, 519 (16), 172-175.

[2] Wang W.L., Wang Y.J., Li R.M. (2011). Design of Drilling Simulation System Based on Virtual Reality Technology. Computer Technology and Development, 21 (9), 171-174.

[3] Li Y.N. (2017). Application of Maya Scene Modeling Technology in Solid Modeling Design of Mud Puppet Animation.Modern Electronic Technology, 40(19), 143-145+149.

[4] Yao X.H., Li L., Zhang J. (2013). Application of Virtual Reality Technology in Aircraft Design. Aviation Manufacturing Technology, 423 (3), 67-70.

[5] Hong D.F., Lu W.X., Li W., et al. (2012). Design and Implementation of Three-Dimensional Virtual Campus System. Geospatial Information, 10 (1), 84-87.

[6] Li F.J., Wang Q., Ji P.Y. (2015). Case Scene Reconstruction Method Based on Virtual Reality Technology. Experimental Technology and Management, 32 (5), 124-126.

[7] Wang H., Xu M.L., Mao T.L., et al. (2017). Review of 3-D Group Animation Simulation. Journal of Computer Aided Design and Graphics, 29 (2), 211-220.

[8] Pu Q., Xu Y. (2004). Interactive 3D Face Animation Using Cult3D Technology. Journal of Computer Aided Design and Graphics, 16(3), 382-384.