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The Integration and Application of VR Technology and 3D Animation Design

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Abstract: With the progress and improvement of science and technology, China's digital technology has also been developed rapidly. Among them, VR technology and three-dimensional animation design technology is the representative of two advanced technologies, and the fusion of the two technologies is also in line with the needs of the times, better play the advantages and characteristics of the two technologies, in the computer program development as well as cultural processing, etc. has been more applications. the fusion of VR technology and three-dimensional animation design has the characteristics of program, diversification and virtualization, is the future of science and technology The development direction.

Keywords: VR technology, 3D animation design, integration

1. Introduction

Since the 21st century, VR technology and 3D animation technology have developed rapidly and have been integrated into people's lives. The fusion of VR technology and 3D animation design can enhance the realism and spatial sense of the scene, which is closer to people's life. At the current stage, some universities and hospitals have begun to research VR systems, etc., more applications and education, medicine and games and other fields.

2. VR technology and 3D animation design overview

2.1 VR technology

VR technology (virtual reality technology) refers to the use of computer technology and so on to provide a virtual spatial experience, which can make people immerse themselves in the scene and the sensory experience more realistic (Du, 2019). VR technology is used in a wide range of applications, such as building simulation and car driving simulation, etc. The implementation of VR technology is mainly driven by the computer program, which provides people with a more pleasant auditory experience by changing the running program. This is the case with the VR technology.

2.2 3D animation design

3D animation technology is similar to VR technology in that it is driven by a computer programme to achieve a 'three-dimensional' animation. 3D animation design is based on a computer programme to construct 2D images, through the construction of 2D animation from different perspectives, to establish a more realistic and effective dynamic image; compare the dynamic image with the actual reference, adjust the individual image parameters; finally, through the construction of objects or places for scene rendering, etc., through the operation of the computer programme, to achieve the dynamic and three-dimensional effect of the picture (Du, 2019). 3D animation technology is able to fuse graphics from all angles to realise the dynamics of graphics, that is, 3D graphics, which can obtain a clearer picture quality and effect, further enhancing the audience's experience (Li, 2021).

3D animation technology is widely used in various fields, for example, in film and television shooting, in the completion of high-altitude work or martial

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arts action, the use of actors is more dangerous, some movements can not be completed, and the application of three-dimensional animation technology, can be combined with the real scene, the construction of a three-dimensional environment, both to ensure the quality of film and television works, but also to reduce the risk of shooting. At the same time, 3D animation technology can dynamically modify the content of the work according to the needs of the work, and can also provide fuller colours than 2D animation, to achieve visual beauty (Cheng, 2022).

2.3 VR technology and 3D animation design

VR technology and 3D animation design both require the virtualisation of actual objects through the use of computer programs to construct an image of the target. vR technology and saD animation design technology both meet the actual psychological needs of people and are better used in life. However, there are also differences between VR technology and 3D animation design technology, such as VR technology is mainly to enhance people's real feeling for virtual space, while 3D animation design technology is to process the image and provide a more colourful and realistic picture. Compared with the two technologies, VR technology pays more attention to the sense of experience (Wei & Wang, 2021). Entering the 21st century, people's life and material level have been greatly improved, also began to focus on the pursuit of spiritual, all walks of life also began to focus on the dissemination of environmental protection concept, part of the three-dimensional animation design also to the theme of man and nature, green works of propaganda (Deng, 2022). In addition, VR technology is widely used in medicine, entertainment, animation, decoration German design, as the core part of the Chinese cultural field, three-dimensional animation design is mainly used in cartoon animation, online games and multimedia fields (Lai, 2021). the combination of VR technology and three-dimensional animation design has effectively promoted the development of China's animation industry, ensuring the flexibility and realism of three-dimensional animation.

3. VR technology and three-dimensional animation design methods

3.1 Model establishment

The key part of 3D animation design is modelling. When modelling, the creator uses VR technology to design the corresponding models and scenes, using the mutual integration of animated characters and human-computer interaction to make the animated characters more realistic and vivid. Before modelling, the relevant staff need to collect the corresponding materials and take aerial photographs of the scenes in advance, so as to enhance the effect of 3D animation design. In addition, in order to enhance the flexibility and authenticity of modelling, 3D scanners can establish relevant data by comprehensively scanning real objects and storing the data (Forestry, 2021).

3.2 Motion capture

In the production process of 3D animation design, VR technology combined with 3D animation production software captures and tracks relevant information, adjusts moving objects to match the camera's filming angle, and gives the audience a realistic scene experience. the application of VR technology can more quickly meet the needs of designers and obtain rich data information, animation scenes and character images. For example, in the animated film "Qin Shi Ming Yue", the staff enhance and adjust the characters' movements through 3D animation design, making the overall animation effect more realistic and enriching the characters' roles.

3.3 Technical adjustment

In the process of combining 3D animation and VR technology, the adjustment technology can enhance the overall effect of the picture, through the adjustment technology, can let the computer to correct the data. This adjustment technology can make to animation design more three-dimensional and effective, also let the animation more standardized, at the same time enhance the staff's work efficiency, promote the development of the overall animation industry.

4. VR technology and 3D animation design

integration advantages

4.1 Enhance the audience's experience and perception

3D animation design is more widely used in the field of film and television production, and can enhance the structural processing of the video, ensuring the smooth effect of the articulation of the picture and the rationality of the collocation. In the film, each frame of animation in the computer reality out, three-dimensional animation design technology can be modified for each frame of animation, the use of virtual programs to synthesize, enhance the viewing effect. VR film can meet the needs of the audience, the experience is more intense. For example, in the presentation of bullets, through the application of technology, can let the audience actually feel the danger of bullets flying, and the pain of being hit by bullets, the presentation effect is very realistic (Du, 2019).

4.2 Improve the effect of visual communication design

In the three-dimensional animation design, visual communication design is also more commonly used, the purpose is also able to make the product more infectious. The integration of visual communication design and VR technology can enhance its design effect, by adjusting the colour, light and darkness of the picture, so that the picture has a more hierarchical sense. By integrating the elements in the picture when designing a product, a new pattern of elements can be constructed, making the spatial pattern more vivid and realistic. In addition, visual communication can also tap into the language of graphics and further enhance the effect of the work by integrating it with VR technology.

4.3 Building a good cultural atmosphere

The fusion of VR technology and 3D animation design can enhance the precision of cultural processing. With the construction of VR technology, we can feel the traditional culture, imagine and construct the future cultural inheritance and development through the cultural atmosphere in the virtual space, so that people can better experience the real scene.

5. VR technology and 3D animation design fusion application development direction

5.1 VR technology applied to the construction and design of 3D animation models

In the application process of VR technology, relevant staff need to carry out the establishment of three-dimensional models, so as to improve the analysis of technology and make the picture more realistic and effective. Through the regulation technology of three-dimensional animation, the content of the animation is tau corrected and modified, and at the same time, through the auxiliary role of the computer, the relevant data is processed to improve the level of creation of three-dimensional animation. In the future, in order to ensure a more realistic and effective effect, a more realistic virtual environment needs to be considered when model building is carried out to bring a better interactive experience to the audience. In the process of applying VR technology, communication and exploration of relevant imitation techniques are needed to change the corresponding creation methods to be able to show the picture more smoothly. In the early stage of design, focus on the effective combination of picture and character elements, and pay attention to the collection of data and information. In addition, it is also necessary to focus on the theoretical knowledge related to VR technology to improve the overall level of animation creation(Tu, 2020). Animation design also needs to make reasonable use of VR technology to complete the needs that cannot be met by filming and provide more realistic scenes by tracking the movement trajectory of objects.

5.2 Enhancing 3D animation teaching

VR technology teaching is the development and progress of teaching technology.In 2018, the Ministry of Education issued the Action Plan for Education Informatization 2.0, which points out that it is necessary to "take national high-quality online open courses and model virtual simulation experimental teaching as the carrier".VR technology can provide a more realistic virtual space, which can effectively

solve the problem of three-dimensional VR technology can provide a more realistic virtual space and can effectively address the representation of three-dimensional space and the modelling of dramatic scenes.

VR technology only requires the assistance of a computer, and students are able to interact with virtual objects through the computer, which is relatively simple to operate. Although these interactions are relatively simple and easy to carry out, in practice students can be easily disturbed by the external environment and cannot fully concentrate on the virtual environment, but this virtual environment provides students with a more realistic experience, is simple and easy to operate, and is more conducive to teaching and learning. For example, for the existence of dangerous subjects or more abstract subjects, VR technology can bring a more vivid environment, realistic scenes can be more mobilised students' enthusiasm, so that students really grasp the knowledge and promote the teaching effect.

5.3 Tracking the movement of objects through 3D animation design

The integration of VR technology with 3D animation design allows the actual movement of objects to be tracked and captured. By processing the relevant information on the computer, it is possible to obtain the data information needed for the animation design. By analysing the data, the staff concerned can make appropriate adjustments to the movement of the objects, ensuring that the filming process goes smoothly and enhancing the audience's experience of the images.

In China, three-dimensional animation design started relatively late. In recent years, with the development of science and technology in China, VR technology has gradually come into the public's view. In the future, VR technology will be more integrated into the fields of education, medicine and real estate, etc., and the integration and application of VR technology and three-dimensional animation design can provide a more perfect picture (Wang, 2017).

6.Conclusion

The application of VR technology can provide new opportunities and development for the traditional 3D animation design, and the integration and application of VR technology and 3D animation design can bring good viewing experience to the audience. In the future, in addition to integrating VR technology with 3D animation design, we should also learn more about advanced technologies at home and abroad to promote the comprehensive, healthy and sustainable development of China's 3D animation industry.

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Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

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