Application of Computer Vision in 3D Film

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Abstract. As a form of entertainment in our daily life, movies have been a luxury at the beginning and become a normal form now. With the continuous development of The Times, film production technology is also constantly challenging innovation. Especially in recent years, high-end technology has been added to film production in order to make the audience have a better movie experience. The operating principle of 3D movies is simply to make use of the visual differences formed by people's eyes when watching objects, record these differences respectively, and then project them onto people's eyes with computer image technology, so that the audience can have a stereoscopic viewing effect. In the actual film shooting, due to the setting requirements of the scene modeling, a large amount of financial and material resources and manpower are often needed in the production process to create a desired scene, which also increases the production cost of the film, consumes a large amount of shooting time, and even wastes the actor's modeling degree gratuitously. As for the movie scene space, it is actually divided into two parts. One is the real space environment, that is, the scene space in which actors need to perform, and the other is the psychological space of actors in the movie. This paper starts from the computer image processing technology, analyzes the application advantage of this technology in 3D film production, and thoroughly the modern society audience for the ultimate pursuit of the film, from multiple aspects of the development of 3D film and the application of computer image processing technology in 3D film for a detailed explanation.

Keywords: 3D Film, Computer Image Technology

1. Introduction

Movies, as a form of entertainment in our daily life, have gone from a luxury at the beginning to a normal condition now. With the continuous development of The Times, film production technology is
also constantly challenging innovation. Especially in recent years, high-end technology has been added to film production in order to make the audience have a better movie experience [1]. The introduction of 3D films has enabled the film industry to enter a stage of rapid development, and also enabled the audience to get a higher visual experience. And the maturity of 3D film technology, it is with the help of mature computer image technology, so that it can show a strong picture in front of the audience. After decades of development, computer image processing technology has gradually promoted the development and restructuring of our country's film industry.

2. The significance of computer image scene in 3D film

The operating principle of 3D movies is simply to make use of the visual differences formed by people's eyes when watching objects, record these differences respectively, and then project them onto people's eyes with computer image technology, so that the audience can have a stereoscopic viewing effect.

In the production of 3D movies, the design of the scene is very important. The definition of the scene refers to the various entities formed in the space related to the subject. In the scene design of 3D film, it refers to the modeling design of all objects except the modeling of tasks in the film, so as to form a three-dimensional scene with great viewing effect [2-4]. This kind of scene is used to allow the characters in the movie to perform activities, including the design of natural environment and various props, collocation and the outstanding acting skills of the characters, so that the audience can have a more profound three-dimensional sense of watching the movie.

In the production process, 3D is as important for the design of scenes as for the modeling design of characters. It is also a key creation link used to foil the three-dimensional sense of characters and the film picture style. It is extremely important for the visual presentation and the embodiment of the style and theme of the whole film. In the production of a movie, the characters need to connect the story in different scenes, so in order to better shape the set role modeling, the scene design in 3D movie is often more complicated than the role modeling design.

3. Breakthrough of computer image processing technology in scene modeling

In the actual film shooting, due to the setting requirements of the scene modeling, a large amount of financial and material resources and manpower are often needed in the production process to create a desired scene, which also increases the production cost of the film, consumes a large amount of shooting time, and even wastes the actor's modeling degree gratuitously [5,6]. The use of computer image processing technology can create many scenes that are not easy to be created in reality in the virtual environment, and can make up for some defects existing in the traditional scene creation, so that 3D movies can be more vivid.

In today's extreme pursuit of movie watching effect, computer image processing technology can perfectly show the scene that the audience expects in front of the audience. The creativity of using computer image processing technology is omnipotent and the audience favorite fantasy, science fiction movies, the combination of traditional films can be made with surreal scene is not possible, but also can enhance the audience's audio-visual experience, let the audience can see ourselves on movie scene at the same time, the best meet the audience on the vision.
Computer image processing technology is not only driving the trend of 3D films, but also increasing the creativity of traditional live-action films. After using the technology to create 3D films, audiences are no longer satisfied with live-action themed films. What the audience wants more is to watch the visual experience based on the real emotion, especially for the scene that cannot be seen or cannot exist in reality, the audience is full of longing.

In terms of film production, traditional films need to use cameras to shoot a large number of long films before they are produced, and then turn to indoor production process after the shooting. Indoors during production, first of all need to camera a lot of video clips, and then use relevant technology to cut out pieces of artistic processing, eventually into film rendering of patchwork, this process is not only dull red, also need to need to make their staff for the many details during the filming in real time [7]. And using computer image processing technology, create the movie scenes, you need to be able to use computers in outdoor filming process, only need according to the script to actors to play action and expression in place, the next will be filmed video clips into creating a good scene of ahead of time, set by the human eye visual Angle, video clips and fusion, rendering a scene, eventually form a strong visual effect. (figure 1)

![Building Film Scene](image)

**Figure 1.** Breakthrough of computer image processing technology in scene modeling

4. **The computer image technology realizes the expansion of scene space**

As for the movie scene space, it is actually divided into two parts. One is the real space environment, that is, the scene space in which actors need to perform, and the other is the psychological space of actors in the movie [8]. For the real space environment, in the process of film production, you only need to design the scene according to the setting of the script, which is relatively easy to achieve. For the actor in the movie's psychological space, this space is to belong to a kind of invisible scratching their space, and the audience for this type of space is also especially love, so for the establishment of the virtual scene is the need to carefully build environment space, enhance the mystique of the film, the audience can better experience to the virtual space scene in the movie. (figure 2)
4.1. Expand scene space with visual features

Different from the traditional live-action movies, the biggest advantage of 3D movies is that it can simulate the eyes of the human body, so as to show the three-dimensional picture of the movie scene. Therefore, in 3D movies, the construction of scene space is particularly important. This is especially true for anyone who plays a lot of big games [9,10]. Due to the long-term play in the virtual game scene, this kind of crowd has strong cognitive ability for the realistic scene space, and also has high requirements for the construction of the scene space. Since the scene presented by the human eye in front of the reality is generally three-dimensional, the 3D film produced by computer image processing technology can be more suitable for the audience in terms of three-dimensional visual effect performance.

4.2. Use lens language to expand scene space

The expression of 3D film is a kind of artistic sublimation of time and space interlaced with each other. In the process of advancing the plot of the film, the environment of the actors also needs to change in real time. The scene space is not only the place for the actors to stand, but also the foil for the actors' expression in the film. Thanks to the application of computer image processing technology, 3D movies can present a satisfactory effect for the audience in this respect.

In addition, the motion shot formed by the full use of the camera during the shooting process can also show the three-dimensional sense of 3D movies. When the objects in the scene constantly impact towards the audience's eyeballs from afar, the audience's visual nervous system will get a great sprint, thus stimulating the audience's sense of substitution when watching the movie. This sense of substitution enables the audience to form a resonant echo with the characters in the movie, as if the audience itself is in the movie scene. This is the charm of 3D movies. It is also due to the development of computer image processing technology that such dreamlike scenes can take place around us.

5. Conclusion

The application of computer image processing technology, let the audience in the audience experience has been greatly satisfied, but also make the audience for the film to meet their expectations. Using computer image processing in the movie scene modeling of virtual construction, make the scene in the
movie can be more thorough popular feeling, its not easy to build or create reality reality impossible scene, and the scene is deeply rooted in the hearts of the people of rendering, which greatly impact the visual nerve of the audience, the audience will be able to enjoy the scene in the movie to watch. The application of computer image processing technology to a large extent can also release a lot of manpower in the process of film production, and there is no need to spend more money to build scenes, which reduces the great burden of film production. This paper starts from the computer image processing technology, analyzes the application advantage of this technology in 3D film production, and thoroughly the modern society audience for the ultimate pursuit of the film, from multiple aspects of the development of 3D film and the application of computer image processing technology in 3D film for a detailed explanation.

References

[1] Nathan. The Application of Digital 3 D Technology and Computer Nonlinear Technology in Jilin Scenery [D]. Film Dalian Maritime University.

[2] Cao Zhiguo, Zhao Fulong, Xiao Yang, et al. One way to convert 2 D video into 3 D video :2017.

[3] Zhao Xiao, Huang Runqiu, Wei Sui. Terrain 3 D Reconstruction [J]. Based on Computer Vision Geological hazards and environmental protection ,2004(02):77-80...

[4] Zhao Tianqi. The artificial intelligence infuses the new motive force [J].] D 3 film and television industry Science and Technology Bulletin 36(9):66-72.

[5] Wang Chong. A Study on Binocular Visual Stereo Matching Based on Visual Significance and Machine Learning [D].

[6] Richard J.Radke, Ye Songqing. Computer Vision Visual Effects [J].1 Review of Foreign Science and Technology New Books ,2014(5 issues):13-14.

[7] Wang Shiyan. Motion segmentation and motion estimation [D]. based on 2 D/3D video Zhejiang University ,2013.

[8] Old man. Computer vision is king [J]. in the Internet age Chinese computer users ,2008,11(11):6-6.

[9] Xian xi. The Evaluation and Improvement of 3 D Video Postprocessing based on parallax information [D]; and University of Science and Technology of China.

[10] Guo Guanjun. Research on Video Conversion Technology D Naked Eye 3[D]. Research University of Electronic Science and Technology.