

The Application of VR Technology in Film Production

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Abstract. In recent years, with the continuous maturity of virtual reality technology, the scope of application in various fields has been expanding. VR technology has gradually moved to the film industry. Since 2014, VR technology has become a new round of discussion and practice in the film industry. This paper will conduct an in-depth discussion on the production status and influence of VR films from three aspects: the actual production of VR films, the challenges VR technology brings to the current film industry, and the prospect of VR technology application in the film industry. This paper also researches the practical application and influence of VR technology in film production. The future development prospect of VR in film is discussed and analyzed, and the relevant conclusion and summary are made at the end of the article.

Keywords: VR technology, film production, VR film, prospect analysis.

1. Introduction

Film is a comprehensive audio-visual language art. Since its birth, the characteristics of film determine that the development of film is closely related to science and technology. The change of film picture proportion, the updating of shooting machine, the improvement of post-production technology and so on, all of them bring new development pattern to the film. The successful release of avatar, a science fiction film directed by James Cameron in 2009, triggered a worldwide craze for 3D film production (Figure 1). Subsequently, IMAX, 4D, 4K and other technologies have sprung up and been widely used in film production, greatly shortening the time of technological update and iteration [1]. In 2014 Facebook announced the acquisition of Oculus, a company that makes virtual reality headsets. In 2015, Alibaba, Tencent, Baidu and other Internet giants have invested in VR, hoping to become pioneers in the field. In 2016, Huawei unexpectedly announced its first generation of VR glasses at the national travel conference of its products P9 and P9Plus, marking Huawei's official entry into the VR field. Subsequently, Xiaomi and other companies have also said that they are preparing relevant laboratories, in order to accelerate the pace of entering the VR field. VR technology has become a new hot spot in the film industry following 3DIMAX and 4K. Many industry insiders say that 2016 is the first year of virtual reality.



Figure 1 The film of Avatar

2. The actual production process of VR movies

In the film industry, the shooting and production of pure VR films is still in a process of gradual progress. VR film "is not only a simple technical upgrade, but with its popularity and wide range of application, from content to terminal, from software to hardware, will have a far-reaching and extensive impact on the entire video industry."

2.1. Actual Shooting Operation in the Early VR Film

The making of any film is inseparable from the pre-shooting and post-production. First of all, VR films are quite different from today's film production in terms of early shooting. As the author of this paper has the honor to participate in the shooting and production of VR videos, this paper takes the GoPro (Figure 2) machine that the author has operated as an example to illustrate.

Due to VR shooting, a common camera needs at least six GoPro machines to achieve 360° up, down, left and right without dead Angle shooting. Before shooting, it is necessary to adjust the picture ratio of all shooting machines to 4 : 3 in order to obtain the maximum view range and facilitate the stitching operation of the later picture [2]. The resolution of each machine must be consistent. Unlike using a traditional tripod, A monopod is required for VR shooting. On the one hand, due to its small footprint, it is easy to use AE to erase in the later stage. On the other hand, the combination of six VR machines is equivalent to a regular hexahedron. The combination point of the monopods and the machine is located on a sharp corner of the regular hexahedron, which can capture the shooting picture to the maximum extent. The traditional tripod is larger than the monopods, which will produce a certain screen block. All the machines must be turned on by WIFI to ensure that each machine is turned on at the same time for shooting, otherwise the frame rate is not synchronized when the picture is stitched in the later period, resulting in the picture cannot be synthesized.



Figure 2 The diagram of Gopro

After the official boot, the need for the machine to hit the board or slightly turn the motor, is in order to carry out sound and picture synchronization authentication in post-production, in order to better maintain the frame rate synchronization screen smooth. Although there are at least six machines in one position, it is necessary to aim the main body of the camera at one camera so that the whole body can be photographed. Each camera is placed on a different surface of the hexahedron. If two cameras are aimed at each other at the same time, the subject must be located at the intersection of the two machines, resulting in incomplete or fragmented shooting of the subject. Especially when shooting moving shots or capturing the movement of the subject, the later pictures presented by the two machines are more or less unnatural because of the slight dyssynchronization of the painting surface [3]. Under the playback of head-mounted VR display device, the viewing effect is affected, and 100% immersive experience cannot be achieved. Nowadays, most movies are shot at 24 frames per second, but in the actual shooting of VR movies, at least 80 frames per second is required to make the action scenes more realistic and smoother. In order to better meet the immersive experience of the virtual era, the frame rate of VR movies will be greatly increased.

2.2. Post-production of VR Films

Before the formal post production, it is necessary to sort out the material of the film. At this point, the basic footage unit changes, and each shot output is actually equivalent to the output of six video footage (because there are six cameras). Before editing the material, import the picture taken by each machine into the editing software for picture stitching, which is the most basic and crucial step in post-production. Now Kolor Autopano Video Pro and Kolor Autopano Giga are basically used for production and modification. For the initial import of material in Kolor Autopano Video Pro, after selecting sound or picture synchronization, the computer will automatically edit, so that the six pictures are in frame synchronization at the same point where the sound is recorded or the picture wobble is captured [4]. Modify the material in Kolor Autopano Giga, such as adjusting the vertical and balance of the picture. The modified material will be automatically saved in Kolor Autopano Video Pro after adjustment. Open Kolor Autopano Video Pro again for the final output of the material. The output material can be used for normal video production in Pro or AFTER Effects. When finished, you need to drag and drop in the Kolor KolorEyes player to view it.

3. Challenges brought by VR technology to the current film industry

3.1. Director Creation

The creation of VR films will have a certain impact on the traditional director mode.

In traditional film production, only one and a half sets are needed to meet the needs of filming, but in VR movies, the audience will see 360° video without dead Angle. From two-dimensional screen viewing to three-dimensional space experience. This means that the director needs to have 360-degree 3d production thinking, and more need to build a panoramic shed or completely adopt natural scenery in the open-air shooting. In the panorama shed, you need to hide the lights or use more natural light directly. Recording requires a lot of use of "little bees", relatively light and small equipment hidden inside the actors' costumes [5].

Audiences are more likely to be attracted by the story in the viewing mode of head-mounted VR display devices. The audience has changed the traditional mode of watching the film, that is, the distance between the viewing seat and the screen is dynamically accepted. Viewers can change their viewing point and position at will. Under the new viewing mode, the director is required to start from the first-person or third-person viewpoint more often, and to attract the audience's viewpoint as a better leader, so that the audience can watch the whole story to the end [6].

Films will move more from linear narrative to non-linear or multi-linear narrative, challenging the director's ability to control the story structure. The audience can choose the viewing point at will, which means that the audience does not necessarily follow the set plot arranged by the director, and the audience's view point may always be free from the main story. This requires the director in addition to the main plot also need to take care of the development of various branches and veins. In addition to the hero, you need to add non-hero story development. The whole plot may evolve into a series of short stories. The director needs to use sound, light, props and so on to attract the audience's attention, so that the audience as much as possible to follow the director's preset main plot development.

3.2. Camera Language

The film's most important shot language has changed accordingly. Camera language is gradually enriched with the development of films, but in VR films, the importance of camera language is no longer obvious. Film is to tell a story through the screen, and the lens language is an important tool to assist the story telling [7]. In the creation of VR films, camera language has been reduced to the period of single camera language in the late 19th century and early 20th century. VR machine is placed in a single fixed position, there is no so-called push, pull, shake, shift and other changes. When shooting motion shots, the VR machine should be placed on a track skateboard to promote shooting.

As for the traditional film far, full, medium, near, special shot conversion is all abolished. It seems to have returned to the original central point of the theater. The lens can no longer become the smallest unit of the film, a space scene will become the smallest unit. There is no clear division of labor and meticulous photography work, in the shooting before only need to test the location in advance, the machine can be placed and installed.

3.3. Performance of Actors

VR film creation has brought greater challenges to actors' performance. Instead of acting in terms of a scene, actors are acting in terms of a space. It's more like a drama, in a fixed area. The director and staff cannot conduct command on site. Taking the panorama shed as an example, the director and staff need to hide outside the panorama shed and conduct "blind" command on site through intercom and other devices. Actors also need to pay attention to the recording equipment while performing, because the traditional recording pole pickers are no longer present. The actors must perform the story in this space perfectly according to the requirements. If any accident happens in the middle of the process, such as laughter, temporary forgetting of words, damaged recording equipment, etc., the whole material is completely abandoned, and it needs to be repeated again. The cost of filming for the entire crew will undoubtedly increase significantly.

3.4. Film Theory

The overall production of VR films is different from that of traditional films. Changed the traditional film production process of montage techniques, audio-visual language rules. The film theory will lay more emphasis on the study of audience psychology, communication mode and psychoanalysis. Previous studies of film montage theory may gradually fade away.

4. Forecast the development prospect of VR technology in the film industry

VR is popular right now, but so far, it's only conceptually hot. The application of VR technology in the field of film has not been widely developed. Cinema line has not officially released a VR movie made with pure VR technology. The reason lies in the limitations of VR technology itself, which limits the development of VR films. The birth of each kind of technology is a double-edged sword, which has its own disadvantages as well as advantages [8].

The application of VR technology in the field of film currently exists in three aspects, one is the VR experience version of film. "One aspect is to make VR movie experiences and promote movies. U.S. movie companies including Disney and FOX have collaborated with VR technology companies to produce VR promotional videos for some movies. Domestic movie "Little Door God" also launched a VR movie promotion video (Figure 3). The other is making short films. In early 2015, the film team inside Oculus, a virtual reality company, unveiled a VR short film called LOST at the Sundance Film Festival. In July 2015, they released their second VR short, HENRY, in which they designed 'interactive' scenarios that changed the completely passive experience of the audience." On the other hand, the production of landscape films, because it is a landscape film without any complicated plots, the focus is only on highlighting the beautiful scenery and magnificent mountains and rivers, so VR technology is widely used in it [9].



Figure 3 A promotional image for Little Door God.

VR technology can provide the audience with a 360-degree viewing mode without dead Angle, which expands the audience's viewing field and Angle, but also limits the telling time and plot development of the story itself. So far, most VR films are in the exploratory stage, and most so-called VR films are controlled within ten or five minutes. First, under the viewing mode of head-mounted VR display device, viewers will suffer from visual fatigue if they watch for too long. Second, as the audience's free choice is greatly increased, the plot becomes more complicated (similar to running a maze), which lengthens the production time and makes it more difficult to make films. Therefore, in terms of plot setting, more choices are made to simplify. And VR technology can better show what happens in a confined space. According to this feature, you can shoot some films similar to the escape room. Suspense films can be developed faster with the help of VR technology [10].

In suspense films, Blizzard Heights (also known as the "Island" mode) has a better story presentation. It takes place in a confined space, allowing the audience to enjoy the small stories that happen to each person. For example, movies like Shutter Island, And Then There Were None, and The Dead Experiment can all be recreated using VR technology. In terms of screenwriting, there are a lot of stories that can be exploited, such as the work of John Dixon Carr, the king of the chamber of Secrets, in the 1930s and 1940s, known as the golden age of detective fiction. As detective novels have long been regarded as imported from the West, they have not received much attention in China, and detective films are few and far between in The Chinese film industry. If VR technology is applied to the film creation adapted from this theme, it may greatly prosper another type of Chinese film [11].

In the creation of horror movies, VR technology will also bring the best immersion experience to the audience. On the set of horror film production, the director and crew can also wear the corresponding costumes and makeup. On the one hand, it can be conducive to the director in the scene command, on the other hand, it can also increase the horror atmosphere of the film. VR technology can also be applied in some strong sense of space or show space documentary shooting, such as the 1990s documentary "The Last Mountain God", in recent years "human", can use VR technology. "Canada's Felix & Paul released CIRque du Soleil, Jurassic World and other VR documentaries [12]; Caixin media in China used VR technology to report the ShenZhen mountain collapse and other news events, and launched China's first VR documentary kindergarten in a Mountain Village, bringing audiences a different experience from traditional audio-visual content."

5. Conclusion

The development prospect of VR technology in the film industry is beyond doubt, on the premise that the film production must be carried out in accordance with the characteristics of VR technology. Most avoid to pursue the visual stimulation of random technology collage, which will hurt the audience's enthusiasm for VR movies, hinder the development of VR movies. When creating VR films, we should pay attention to the selection of scripts, not to lose one or the other, and achieve the same level of connotation and form. Better integration of technology and art is the right way for the development of VR films.

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