

Creation and Research of VR Panorama Video in Jiu Feng Park

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Abstract: The diversity and low threshold of communication methods and carriers in the era of mobile Internet, the gradual prevalence of VR technology has brought new ideas to Jiufeng Park's display method. Reasonable use of Internet and digital technology to apply VR panoramic video technology to Jiufeng Park's display, research and analysis of VR panoramic video shooting, production and narrative in the process of creation. By analyzing the characteristics of Jiufeng Park, we can choose a creative scheme suitable for Jiufeng park panoramic video, so that users can experience the powerful and interactive Jiufeng park VR panoramic video. This research expands the application range of VR panoramic video, and creatively applies VR panoramic video technology to the display of forest park, so that users can browse and experience Jiufeng park landscape from multiple perspectives.

1. Introduction

VR panorama technology is accompanied by the development of computer technology, combining digital media technology, graphic image technology, network technology, multimedia technology, sensing technology and other information technologies, emphasizing visual reality, panoramic viewing and immersive interactive experience [1]. With the development of VR technology, panoramic technology can more fully realize the reproduction of virtual scenes, bringing people an immersive realism, so panoramic technology is widely used in various industries [2]. The panoramic video turns a static panoramic picture into a dynamic video image by connecting 30 pictures per second. It also has functions such as sound, depth of field, and movement to show the dynamic changes of the scene, compared with the traditional panoramic picture, there is a qualitative leap [3]. Jiu Feng has been a famous scenic spot in the capital since ancient times, retaining a long and complete temple culture and garden culture. In the park, there are many peaks such as the Jiu Feng Mountain Villa in Liao Dynasty, the Xiufeng Ancient Temple in the Ming Dynasty, the Xiangtan Temple in the Qing Dynasty, the Xiaozhai Temple in the Republic of China, the Chaoyang Guanyin Cave and the Millennium Mountain Trail. At present, VR panoramic video is a display method that is very suitable for the Jiu Feng Park, which can greatly enhance the display effect of the Jiu Feng Park. In the VR panoramic video of Jiu Feng Park, people can use less rest gaps to experience endless fun during viewing [4]. Therefore, this study proposes a VR panoramic video of the Jiu Feng Forest Park, and provides a new means and method for the display of the forest park landscape.

2. Shooting

2.1. Shooting equipment

There are many devices on the market that can shoot panoramic video, and new products are also on the market. However, these devices can be divided into the following two categories: integrated panoramic camera and multi-view panoramic bracket. It also needs to be decided according to the actual situation of the project and the needs of the work.

1. Integrated panoramic camera

The integrated panoramic camera is usually easy to operate and can quickly capture and automatically splicing the output video without subsequent splicing, or even quickly share it to the website. It can be started at any time, and the panoramic video can be easily and quickly experienced. The attached software can quickly watch the effect after the stitching is completed [5]. Divided into commercial and non-commercial based on cost, such as Insta360 ONE and Insta360 Pro2, Insta360 ONE is cost-effective, with two lenses, can complete 7K panorama and 4K panoramic video shooting, also equipped with Flow State anti-shake technology, and Insta The 360 Pro2 is a commercial-grade professional panoramic camera with six lenses for 8K panoramic video capture.



Figure 1. Integrated panoramic camera

3. Multi-view panoramic bracket

Multi-view panoramic brackets require a combination of a motion camera and a panoramic mount. Through the panoramic bracket, the video images of multiple cameras can be captured, and the panoramic video synthesis software can be used to stitch multiple independent videos into one complete panoramic video. Its main advantage is its high resolution. Even the most common 6-mesh panoramic bracket, the highest video output specification can reach 7500*3750, and the frame rate can reach 60fps. This frame rate and resolution are fully qualified for commercial photography [6]. Of course, its shortcomings are also obvious. First, as the resolution increases, the price also rises. Second, the learning curve is steep, and you need to be familiar with the panoramic video synthesis software to get better stitching effect.



Figure 2. Multi-view panoramic bracket

The shooting work in the panoramic video of Jiu Feng Park has certain difficulty. Considering the high terrain of the Jiu Feng Park and the rugged roads, the shooting equipment needs to be relatively portable. Considering the cost performance and production cycle, you need to consider the visual effect. The Insta360 ONE panoramic camera and the multi-view panoramic bracket were selected for shooting together.

3.1 Shooting scene

In the process of shooting VR panoramic video, the selection of the scene is especially important, especially the real-life shooting humanistic natural environment, which can only highlight the connotation of the film expression through the screening and control of the scene. VR panoramic video is different from traditional promotional videos, and it needs to capture all the 360° images that can be seen at the camera's position, which means that there can be no unsightly dead corners in the picture. By shooting the VR panoramic video of the Jiu Feng Park, the following criteria for scene selection are obtained: First, try to avoid some unrelated objects moving at a safe distance closer to the camera position. Because of the characteristics of the panoramic camera, the safety distance is usually about 2 meters. , close-range object motion will produce a certain degree of stitching problems, affecting the viewing effect. If the shooting environment is more complicated, you can choose to place the camera at a relatively high position, away from obstacles and reduce the proportion of unnecessary scenes in the picture. If you try to objectively restore a scene, try to choose the geometric center of the scene. Position, which can effectively take into account most of the objects in the entire scene, improve the viewer's freedom to view the field, fully reflect the characteristics of VR panoramic video, For example, when shooting Murong Pavilion, the director chose to place the panoramic camera in the middle of the pavilion and photographed the scenery in the pavilion(Fig.3).



Figure 3. Murong Pavilion

3.2 Shooting technique

Compared with traditional video, the current VR panoramic video shooting methods are very limited, most of which are based on traditional shooting techniques. Fixed shooting and moving shooting are the main shooting methods in VR panoramic video. Fixed shooting is the most common shooting method for VR panoramic video. Fixed shooting mainly uses two methods: tripod and handheld selfie stick. Shooting with a tripod is the most stable way to shoot in fixed shooting, but because the VR panoramic video has no dead angle shooting, the director must find some shelters in the scene, so as to avoid wearing, and the distance cannot be too far, otherwise it will affect the real-time monitoring of mobile phones. Look at the effect. And because the director needs to avoid, the camera will cause passers-by to curious and even touch with the hand, which will cause the shooting to fail.

Mobile shooting mainly refers to placing a VR panoramic camera on a mobile tool such as a drone or a car, or walking in a hand-held manner, thereby realizing the movement of the panoramic picture. Because the drone is difficult to shoot and cost, and it is difficult to achieve real-time monitoring and remote control, the most important thing is that the aerial photography will limit the angle that the audience chooses to watch. The Jiu Feng Park is built on the mountain and cannot drive. Therefore, the method of walking by hand is adopted. The hand-held walking method has a poor stability and the picture will cause shaking. Therefore, the handheld camera adopts the Insta360 ONE panoramic camera, and its Flow State anti-shake technology can better solve the problem of picture shaking.

4. Production

4.1 Panoramic stitching

VR panoramic video is different from the traditional video post-production in a new link, and it is also the most complicated part of the workload, which is the stitching of the lens. Different from the traditional video shooting, you can directly import the editing software. Because VR panoramic video is finished with 2 or more lenses, you need to stitch the same scene through professional stitching software to form a complete VR. The panoramic video is provided to the audience. The stitching and stitching of the lens must be adjusted for different dimensions such as the edge of the picture and the color of the light. This is the basis for the quality of the VR panoramic video. There are many mature professional panorama stitching software in the field of VR panoramic video, such as Kolor AutoPano and Nuke. These software are powerful and are generally used in VR videos with a lot of special effects and rich plots. However, the operation is complicated, the computer hardware requirements are high, and the professional team needs a lot of practice to better grasp the use of these splicing software. Thanks to the Insta360 ONE panoramic camera and the multi-view panoramic bracket, the stitching method is different, and the Insta360 ONE panoramic camera can be spliced inside the machine. The multi-view panoramic bracket needs to use the plug-in CARA VR for splicing work in Nuke, and it is necessary to synchronize the time and color of each of the shots before splicing.

4.2 Sound

In combination with hardware equipment conditions and video content needs, the main use of synchronous sound plus background music to provide a sense of hearing, is also the current mainstream VR panoramic video sound solution. Since the external microphone will appear in the panoramic picture, the background music and commentary will be added to most of the pictures to make up for the lack of live sound. Combining the entire sound production process, the current VR panoramic video's visual capture capability is much higher than the sound recording level, which requires VR equipment manufacturers and production teams to work harder to create the ideal VR panoramic vision and hearing system.

4.3 Editing

For the completed panoramic video of the Jiu Feng Park, it is necessary to carry out post-grading processing, and also need to adjust the angle of view, packaging, dubbing, etc., because the panoramic video has its particularity, it has a lot different from the traditional video in the production process. Traditional 2D video can be edited directly after shooting, but traditional software does not support editing and output of VR panoramic video format. Therefore, Adobe After Effects CC 2018 is used to process and edit video material. In this software, there is an effect device for VR Comp Editor, which supports editing of panoramic video. This function can add some video packaging effects to panoramic video. And can avoid distortion in the picture. It is also unnecessary to wear VR glasses during editing, and the VR video clip can be realized only by computer, and finally the VR video of H.264 format is output, which greatly improves the editing speed of the entire video.

The whole picture of the panoramic video is a 360-degree panoramic image, which is equivalent to the spherical seamless map in the 3D software. Otherwise, there will be obvious problems of color fusion on display (Fig.4).



Figure 4. Problems of color fusion

There is also a distortion in the process of video packaging. If it is processed directly in the panorama, distortion will occur when performing panorama playback. Therefore, in the process of video packaging, the VR converter is first used to convert the panoramic video into a normal viewing angle, and then processed, so that the panoramic video can be obtained in the panoramic playback, for example, the addition of subtitles (Fig.5).



Figure 5. Contrast image

5. Conclusion

This article demonstrates the Jiu Feng national forest park through VR panoramic video technology and makes an attempt to display the forest landscape. For the first time, the panoramic video technology was used to display the Jiu Feng Park. Through the panoramic technology, the various scenic spots of the Jiu Feng Park were photographed and processed, giving users a new experience and providing new promotional content for the Jiu Feng Park. When users experience the panoramic video themselves in Jiu Feng Park, they can also pass it on to other relatives and friends to let them experience the culture and beauty of Jiu Feng Park. The VR panoramic video of Jiu Feng Park is a brand-new exploration of the digitalization of Jiu Feng Park, which provides a remarkable exploration for the display form of Jiu Feng Park. Of course, some of the shooting methods, shooting techniques, and post-production in this article are not refined and mature enough. There are also many controversies and shortcomings in video works created with new technologies. But it is these practices and explorations that make VR panoramic video a promising new medium. In the early stage of development, we can find problems early, solve problems, and make effective suggestions for the future development of VR panoramic video, and promote the creation and prosperity of VR panoramic video.

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