

A study on the applicability of interactive technology in VR video content production

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Abstract

The continuous development of virtual reality technology in the last five years has brought about a big change in the future film industry. Interactive VR movies using virtual reality technology in movies showed the result of increasing the immersion of the audience due to the characteristics of interaction. This will provide a unique opportunity for a new experience of immersion in various forms of cinema in the near future. In this paper, the interaction of narrative VR movies was studied as an example of the movie <Buddy VR>, which won the [The Best VR Experience Award] at the Venice International Film Festival, In future development, improve the scene transition, Dizziness, Ways of interaction and other questions, let the audience increase the sense of participation, immersion and curiosity when watching movies, and make watching movies a more interesting thing in life.

Keywords: *Virtual Reality video, Interactive film, Interactive video narrative, Conceivability, Immersion*

1. Introduction

1.1 Research Background

With the continuous development of virtual reality technology, it has been used in all walks of life, bringing unlimited possibilities for the development of video art. Breaking the traditional single linear narrative method can better bring participants to the story and add interactivity. VR film and television are film and television works based on virtual reality. Adding virtual reality technology to it can bring this to the viewer. An immersive experience unique to technology. When the audience is watching a movie, they put on the VR headset and immediately enter the movie scene, and they can enjoy the film and television works in all directions and from multiple angles. Although this method enhances the audience's sense of substitution to a certain extent, due to the limitations of the viewing angle, it is easy to cause distractions, it is difficult to focus on the movie content itself, and reduce the story of the movie and the audience's sense of experience.

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1.2 Research purpose and method

The interactive narrative of VR images breaks the linear narrative of traditional images. Through hearing, visual, tactile and other methods, the multi-faceted embodied experience reconstructs the interactive narrative language and greatly enhances the narrative ability of VR images. VR images can take advantage of the "privileges" of participants' free perspective, displacement, and choice, and add interactive technology to the images, turning a single narrative method into a multi-linear narrative, and bringing participants a better interactive narrative experience.

2. Related Research

2.1 TRINITY

In 2018, VR/AR studio UNLTD cooperated with Unity to create a live-action interactive VR movie "TRINITY". As shown in Figure 1. "TRINITY" is an immersive interactive real-life VR movie, which mainly combines the video shot by the real-life video lens with the 3D visual effects produced by Unity's real-time development platform. The experience of this movie is created in the form of an interactive science fiction vr movie. Putting the user in a world of robots and artificial intelligence where humans have long since disappeared, the few remaining robots must fight for freedom in the last battle.



Figure 1. VR movie "TRINITY"

2.2 The Line

In 2020, a VR film and television short film "The Line" produced by Brazilian content developer ARVORE won the 2020 Emmy VR Interactive Film Award. As shown in Figure 2. "The Line" set the stage in São Paulo in the 1940s and tells an interactive story about love through the names Pedro and Rosa. It is worth mentioning that it is also the first VR narrative experience fully integrated with Oculus Quest hand tracking. No need to touch the controller, you can directly explore the stage of the story with both hands, and feel this moving experience in a more natural way.



Figure 2. VR short film "The Line"

2.3 Afterlife

The real-life VR movie "Afterlife" released in 2019 shows how a family can cope with tragedy through children's eyes to experience multiple perspectives and multiple storylines. As shown in Figure 3 "Afterlife" is composed of 3 parts, with nearly 30 decision points and 3 parallel stories and endings. Different choices will change the story that the audience sees. There are more than thousands of combinations of all branches, and

the audience can experience it every time they watch. Multiple different endings. But in "Afterlife", users make choices by paying attention to people of interest rather than unconscious behavior: if they observe their father, they will follow their father's story; if they participate in the mother's story, they will see how she treats the tragedy. All content has been carefully considered to ensure continuity and transition processing are appropriate, helping the audience to get completely lost in the narrative story without disrupting their sense of immersion due to distracting elements.



Figure 3. Real-life VR movie "Afterlife"

3.VR interactive video narrative

VR should have three characteristics, one is immersion, one is interactivity, and the other is conceivability. In contrast, our current VR video may only have a sense of immersion. Its interactivity and conceivability are not so strong. The interactive narrative of images has changed the single narrative method of traditional images. Through various methods, multi-faceted physical experience reconstructs the interactive narrative language, and the narrative ability of VR images has been significantly improved. VR images can take advantage of the unique characteristics of VR to bring participants a better interactive narrative experience through the free perspective, displacement, and choice of participants. Other peripheral devices such as handles, vibration and other tactile methods can also be used to enhance the real experience of the presence and extend the possibility of interactive language.

Narration is an experience activity based on narration, and its production cannot be separated from the subject's inner experience perception. The interaction mechanism is integrated into the narrative of the story, creating a new narrative experience that combines body and mind. The sense of experience has become a key element of the success of the narrative. The audience's sense of experience plays a vital role in the direction of the VR video story. Through the interaction with the video content, the body and brain are immersed in the story, bringing the body and mind to the story. An immersive feeling. VR movies with interactive storylines can enable audiences to better participate in it. You can choose the plot of the story according to your own preferences. Different choices can drive the development of different plots and bring different plots. Experience. The behavior of the audience determines the direction of the plot, and the audience's words and deeds affect the change of the ending. The audience is no longer an outsider of the film, but a participant.

The Korean film "Buddy VR" directed by Chuck Chae, who won the Best VR Experience Award at the 75th Venice International Film Festival, can stand out from the crowd of outstanding works, and is inseparable from its unique VR film interaction method. As shown in Figure 4.



Figure 4. "Buddy VR"

The film not only has exquisite pictures and high-quality sound effects, but also has a unique storytelling method: the audience can continuously interact with the short film protagonist Buddy to promote the development of the plot, and different interaction methods will also affect the final plot trend of the film. In this process, the audience transforms from a passive viewer role to an active participant role. When movies need to express the emotional explosion of characters, traditional movies usually use lens zoom to express; while VR movies need to interact with the audience to infect the audience and promote the development of the plot. Director Chuck Chae showed a variety of film and television narrative structures, and "Buddy VR" is the second parallel path structure adopted. As shown in Figure 5.

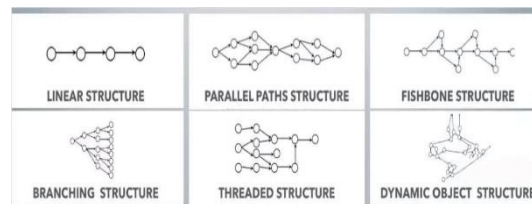


Figure 5. Narrative structure

Different interactions will produce different plots, but in the end they lead to the same ending. From the figure below, we can see that each narrative structure has key nodes, that is, where the plot advances or transitions. When watching a traditional movie, the audience can feel the obvious plot progression nodes, one after another; in an interactive VR movie, these nodes are triggered by the viewer's hand. If the audience does not interact during this period, then the extent of the plot of the film ends here.

4. Difficulties in the development of VR interaction

From your feedback, we can see that the VR interactive video is very attractive and has great potential for development, but it also faces many difficulties. Some difficulties are caused by the VR equipment itself and are difficult to solve. After the continuous improvement of hardware equipment, these problems can be solved. For the other part, you can compensate for these problems by using appropriate music and sound effects when shooting and editing. A better narrative structure can also increase the interactive effect of VR images to a certain extent.

4.1 Scene transition

When the audience wears the VR device to watch the video, they are immersed in the virtual reality and in a state of concentration. At this time, if you need to switch the scene, there will be a short black screen and other effects, which will reduce the immersion and the immersive feeling.

4.2 Dizziness

When watching a VR movie with a moving first-person perspective, there will be a strong feeling of dizziness. If you watch it for a long time from this perspective, you will feel very uncomfortable. This is due to the inconsistency of the vestibular and ocular systems, causing motion sickness. The vestibule corresponds to the IMU in the device (perceives acceleration and direction changes to ensure our body balance does not fall), and the visual system corresponds to the camera on the device.

4.3 Ways of interaction

How to use the timing of interaction in VR movies and the amount of interactive content are also very important parts. If there is too much interactive content in a movie, it will cause little difference from the VR game, and more similar.

4.4 How to "interact"

Although the concept of interaction is very interesting, how to master the degree of use in a VR movie is the key to the success of a VR movie. If there are too many interactive parts in a VR movie, what is the difference between it and highly interactive VR games? After the initial freshness of the audience has passed, the repeated interactive experience afterwards will easily make people feel bored and lose interest in the content of the movie. But if the interactive part is too small, it will be no different from a normal VR movie. It is not well integrated with the plot of the movie, and it feels like interacting for the sake of interaction.

5. Conclusion

The movie itself is an art of viewing. The reason why many viewers like movies is that in addition to the movie itself, they also enjoy this time of watching movies. For traditional movies, the audience needs to watch it quietly and appreciate the content of the movie itself. The emergence of interactive movies has raised the demand for audiences, requiring audiences to interact with them and promote the development of the plot, so that the movie can be fully displayed. The emergence of this form of viewing can bring the audience a sense of freshness and participation that are not available in traditional film and television. In some ways, interactive movies change the position of the audience. Letting each audience change from an outsider to a decision-maker, managing the future subsequent plot and direction of the movie. Greatly Increasing the sense of participation, immersion, and curiosity when watching movies, allowing film watch to become a more entertaining thing in life.

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