

# The Application of Virtual Reality Technology in Film and Television Animation Design in the New Media Age

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**Abstract:** In recent years, the film industry has developed rapidly, which has attracted the game industry an outbreak. Every year, the proportion of the special effects technology of animation, film, and television rapidly increases. This paper summarizes the impact of the combination of virtual reality technology and film, television and animation design, and expounds the development and changes of new media animation architecture on the basis of virtual reality technology and its main characteristics and concrete implementation steps. This paper will play a certain role in introducing and promoting the application of virtual reality technology in film, television and animation design.

## 1. Research Background

### 1.1 Literature review

Virtual reality technology, based on computer technology, graphics and image generation technology and three-dimensional perception technology, provides a new impetus for the development of artistic creation and design (Huang, 2019). Attracted a large number of people from the first bystanders to participants. The school animation specialty has also introduced virtual reality technology, offering courses related to virtual reality (Liu, 2019). More and more enthusiasts graduate from schools or other industries to join the hot emerging industry of film and television animation design. With the gradual development of virtual reality technology, the field of application is becoming more and more extensive (Yan, 2019). It can shorten the development cycle and reduce the production cost when it is applied in the manufacture of industrial products (Sun and Wang, 2017). It can be used in the field of education to achieve online job grading, online management of learning resources, upload and download self-experience learning systems (Wang and Han, 2016). The technical support of virtual reality technology in various fields reflects the importance of social development (Deng, 2017). The development of virtual reality has a higher pursuit of immersive experience, and the current interactive interface has not reached the desired level (Xie and Wu, 2019). Through virtual reality technology, film and television technology, the scenes that conventional lenses can not take are vividly displayed. The interactive experience of virtual reality has been added to guide the public to have a better understanding of the virtual reality technology used in film and television animation (Fu and Yu, 2019). Optimize and improve the traditional pictures which are not usually attractive, add visual wonders to make people memorable and foil the effect of the film. It can make audiences like it more and truly feel the artistic charm.

### 1.2 Research purposes

In the era of new media, how will virtual reality technology affect related industries. There are many fans of animation design who want to collect information, but there is not much information about this emerging technology, and there is little detailed analysis of text materials. This paper introduces the development characteristics of virtual reality technology by sorting out the general process of three-dimensional animation design and production. The rise of virtual reality technology has brought great changes to the animation industry. Then it summarizes the three main characteristics of animation design under the new situation of virtual reality technology. This paper introduces in detail the six production stages that must be experienced in film and television production, and the main aspects that should be paid attention to in each stage. In order to attract

more people to support the improvement and development of virtual reality technology, this paper tries to give readers who pay attention to the application of virtual reality technology to some extent, and then encourage multimedia practitioners to produce more and better works for the broad audience.

## **2. Overview of Related Theories**

In recent years, animation design virtual reality technology has broken through the paper plane with animation cartoons and introduced TV series or movie theater version into the screen and the Internet. And the development of different types of drama merges cross-border creation so that animation technology began to be applied in other types of film and television works. In order to help more vividly display the designer's imagination, create a new and refined character building model, more easily to be recognized by the broad audience. The film and television production team can use the powerful function of virtual reality technology to support the director to play a greater imagination space and to serve the needs of the main plot to design more appropriate characters, environment, decoration, and world outlook. The application of virtual reality technology in animation design, to achieve real independent research and development, independent control, flexible adjustment, especially conducive to promoting diversified development of the animation industry.

Specifically, animation design mainly refers to three-dimensional animation design and production. Virtual reality (VR) technology is the integration and interaction of various software technologies, forming a human-computer interface for human and real environment interaction. In order to produce a specific sensory experience and achieve a certain degree of real environmental experience, it is necessary to integrate a variety of disciplines such as physiology, art and music, computer graphics, human history, and other necessary knowledge. Through specialized three-step processing and creation in the early, middle and late stages, we can complete innovative animation film and television works. The realization of creative ideas is mainly concentrated in the early stage of production. The main characters of the story, the time environment in which it happened, and the basic composition of the scene all concentrate on the modeling process of various models. In the design and implementation, the details of material, color difference, light, and shadow are taken into account. The shot-by-shot draft for a coherent story should also be completed at this stage, which is the guidance for the formation of a coherent picture and the way of narrating the story. At the beginning of the medium-term production, designers should study and understand the script in-depth, and use professional three-dimensional model software such as Maya and 3DMAX to process, render and modify the initial stage model, including material mapping, setting animation frames, adjusting the output of rendering format, etc. This stage is also the most reflective part of the designer's creativity, artistic skills, and artistic feelings. In addition, in the three-dimensional design software, according to the law of camera motion shooting, constantly optimize the shooting position, so that the lens picture is vivid, lifelike and smooth. Post-production is the integration of pre-production and mid-production results, selection of exquisite pictures, selection, and editing, merging and splicing the final complete work. The entire animation production process requires a variety of professionals to integrate computer, art design and other disciplines in order to produce excellent works that can tell good stories and reflect the sense of art.

## **3. The Characteristics of Virtual Reality Technology Film and Television Animation Design in the New Media Age**

### **3.1 Immersion**

Bringing audience immersion is the most obvious feature of the application of virtual reality technology in film and television animation. It mainly includes people's sensory experience and cognitive experience. It is a process in which audiences forget their real world for a short time and get a sense of moving and pleasure. Breakthrough the space gap between virtual and reality, open

the audience's sensory organs, mobilize the sense of hearing, vision, touch, even including taste, smell and so on. Attempting to simulate human perception is the goal of virtual reality animation creation. With the help of relevant equipment, including data helmet and eyepiece, feedback information is collected, and real action is simulated by data gloves and firearms. Make the audience feel in the real environment created.

### **3.2 Interactivity**

Interactivity mainly refers to the user's feedback in every action in the virtual scene, and the key actions can affect the development of the story to varying degrees. The audience is also the protagonist, who can interact effectively with the animated characters or things, feel the experience of the surrounding characters, and experience the joys, sorrows, and sorrows of the animated characters. The NPC characters in the animation will also react according to the user's actual operation. Simulating the interpersonal interaction in real society, the contradictions and conflicts between different animated characters also create authenticity and credibility, which makes the audience participate in the plot development of the story with emotion.

### **3.3 Conceived**

Conceptuality means that participants can freely set goals and conduct activities in virtual scenes on the premise that highly simulation is mature. Based on practical experience, the simulation of dangerous scenes in reality is expanded. Combining with the key points of specific action operation, repeat exercises continuously to improve their professional skills, such as flight simulation, battlefield exercises, mechanical manipulation. Audiences are eager to experience practical activities in real life, which can be experienced in the virtual world at a very small cost. In addition, the education industry through virtual reality technology for the audience to build real animals, plants, natural phenomena, to provide cognitive education for young audiences. The integration of animation creation and virtual reality technology can provide efficient help for training in various industries.

## **4. Application of Virtual Reality Technology in Film and Television Animation Design in the New Media Age**

In the production of new media animation, computer software provides a platform for animation production and acts as a factory for animation production. The process of content production is roughly divided into six steps, which are model creation, model import, attribute setting, attribute testing, camera creation and rendering output. This part of the module design is basically the same as the traditional three-dimensional production. The difference lies in the need to add story branch nodes caused by interaction. From a single plot to a multi-dimensional plot, the characters involved in the interaction lead to several different endings. Before production, writers need to design the conditions that trigger different story nodes in advance. Specifically, what are the related interactive attributes and how the audience will react in advance. Most of the audience's wishes are how to develop the story. Decide the outcome of the mainline and suggest the key operation to achieve the main line in the devala cropment of the plot. Then animation producers use professional software to realize the design concept.

### **4.1 Create model**

At present, the modeling of virtual reality animation design needs to run on the production platform composed of virtual reality software. The commonly used modeling software of the three-dimensional model is mainly provided by Autodesk company's 3Ds Max and Maya. Modeling software has powerful functions, which can realize all the requirements of the creator's model conception. Different software principles are basically the same, mostly using polygon modeling. The production process of the model imitates the process of the sculpture work, follows the order from big to small, from shallow to deep, and strives to pursue the sculpture of details. More convenient is that it can rotate freely and perspective, and it can be modified and viewed at any

time.

## **4.2 Model import**

When a team makes the same project, because different models need to be completed by multiple teams, the models produced by other teams need to be imported into the summary. When a large number of models are imported into the same scene, the models made by computers with different configurations need to be unified in size, location, and classification. Different synthetic software has different recognition format requirements. The model files produced by one kind of software can not be imported directly into another kind of software, so it needs someone to export the corresponding supporting file formats in order to enter the next step. Although the models made according to the specifications can be recognized, the materials, texture maps and lighting attached to the models need to be matched manually. To decompose the workload and cooperate with many people is the necessary guarantee for model importation.

## **4.3 Attribute setting**

After the model is imported, the basic display elements are ready. The next step is to set different physical attributes to the model. Using the attribute quick setup tool of the design software, different elements are set numerically according to the real physical laws, reflecting the changes brought by physical changes in the real environment, such as collision, falling, acceleration and so on. Groups of the same attribute elements have a linkage effect, the elements of different physical attributes should reflect the real physical characteristics.

## **4.4 Attribute testing**

After the property settings are completed, in order to find problems in advance, the property tests should be carried out one by one. Set some motion conditions, such as many objects falling freely to different soft and hard planes, and test the mutual change of the object's attributes and plane attributes when a collision occurs. Re-adjust the attribute parameters that do not meet the requirements. Analyze the gap between the actual situation and the actual situation, further modify the values and supplement the missing conditions for repeated testing until the test is qualified.

## **4.5 Camera creation**

Cameras that take action pictures are added one by one in the process. We need to find the time point according to the story annotated in the script, and set the virtual camera bit in the scene space. At this time, in order to show the effect of animation, multi-angle and multi-position display is often used. For example, a follower shot is taken as the main scene character's follower shot, and a fixed-point shot is taken as a close-up of the character's moving body parts. In a few seconds, switch to another large scene lens to reflect the surrounding environment, and keep up with a propulsion lens to reflect the changes of the character's facial expression. Similar multi-lens switching settings are deployed in the camera creation step.

## **4.6 Rendering output**

The last step is to realize the real experience of virtual reality. In other words, the creator has to connect all the detailed components. Including the sound system, lighting system, natural environment, and other special effects simulation. Create immersion after the first few steps are completed. The environment reflects the different sensations of distinguishing the direction of the object through sound and the distance from the specific position of the audience. It even simulates olfactory experiences such as wind and rain, changes in the odor of animals and plants. The trigger conditions of all these actions are integrated and stored, and reasonably allocated to different batches of workstation computers. The graph is rendered in an orderly and planned batch execution. After completion, the final manuscript will be collected in groups according to the timeline paragraph, and the final manuscript with the planned time length will be formed.

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