

3D Animation Production and Synthesis Process using Chinese Tea CG Short Film

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Abstract:

As the crystallization of art and technology, 3D animation has made the world fascinated by every technological change in the film industry. Due to the huge potential of the animation market, many companies have begun to invest in relevant animation creation plans, which have driven the demand for professionals. With the development of the film industry and the intensification of competition, the 3D animation market will multiply in the future for a long time, and the related industries will double. Everything that people appreciate in the future, movies, TV, and games, were brought about by 3D animation technology. Animation, as a field of art or science has the capability to impart life and zeal to non-living characters. With this, the authors wanted to promote the Chinese culture in a form of animation. Chinese tea culture has a long history. It not only contains material and cultural aspects, but also contains profound spiritual civilization. China is an ancient country with a civilization and Chinese tea is one of the important kinds of etiquette of Chinese. Tea and tea ceremony are essential for entertaining guests. With the use of 3D animated film entitled "Chinese Tea CG, the author aims to promote the Chinese culture and tradition of drinking tea. The authors presented the process of creating the 3D animation and illustrated the 3D animation production process.

Keywords: *Animated film, Chinese culture, Short film animation, Three-dimensional animation*

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I. INTRODUCTION

The 3D animation is also commonly referred to as CG animation or computer animation. Computer animation, also known as computer graphics, is a technique for making animations by using computers. It is a sub-area of computer graphics and animation. In recent years, animators have increasingly used 3D computer graphics, even though 2D computer graphics is still widely used. Sometimes the final part of the animation is the computer itself; sometimes it is another medium,

such as movies and cartoons. Computer Graphics (abbreviated as CG) is a scientific discipline that studies computers to create computer graphics with the help of hardware and software. It is a branch of computer science, focusing on the digital content of digital synthesis and operational vision.

As the crystallization of art and technology, 3D animation has made the world fascinated by every technological change in the film industry. Everything that people appreciate in the future,

movies, TV, and games, were brought about by 3D animation technology. It brings people not only the audio-visual experience, but more importantly, it maximizes the visual and interactive technology charm beyond the attitude of all industries and subvert the traditional concept of "watching movies". This 3D animation design is a very independent and innovative technology form created by the development of animation design and computer production. In 1995, the release of "Toy Story" by Disney, which used pure three-dimensional animation, has achieved great success. Further, 3D animation quickly replaced traditional animation as the most popular cartoon. Disney's subsequent release of "Toy Story", "Tangled", "Wreck-It Ralph", "Frozen", "Big Hero 6", "Zootopia", "Moana" have achieved great success. In addition, three-dimensional cartoons such as "Madagascar", "The Croods", "How to Train Your Dragon" and "Kung Fu Panda" released by DreamWorks have also achieved great commercial success. The use of 3D animation in movies is even more magical. "Pacific Rim", "Marvel's The Avengers", "Iron Man" and "X-Men: Days of Future Past", can be said that the movie can no longer leave the participation of 3D animation. Due to the huge potential of the animation market, many companies have begun to invest in relevant animation creation plans, which have driven the demand for professionals. With the development of the film industry and the intensification of competition, the 3D animation market will multiply in the future for a long time, and the related industries will double. Chinese tea culture has a long history. It not only contains material and cultural aspects, but also contains profound spiritual civilization. China is an ancient country with a civilization. It is a kind of etiquette and attaches great importance to etiquette. Tea and tea ceremony are essential for entertaining guests.

Objectives

This study aimed to present how 3D animated short film was created, to illustrate the 3D production process and production relations, and to promote Chinese culture and tradition of drinking tea in a form of 3D animation.

II. LITERATURE REVIEW

3D Computer Animation

Animation is a field of art or science that has the capability to impart life and zeal to non-living characters. Basically it is based on the phenomenon of persistence of vision that allows the visual illusion of the objects. It is a phenomenon of an eye in which an image continues to appear in one's vision after the exposure to the original image has ceased. This happens for about one twenty-fifth of a second. In early days animation was restricted to only hand drawings. But with the advent of technological know-how animation has got a new face that is known as two-dimensional and three-dimensional animations. A three dimensional animation is far better than two-dimensional. It adds more vigor and vivacity to animation. The world of 3D computer graphics has grown from experimental short films to full integration into the creative process for many types of media. From flying logos to digital actors, the field of 3D computer graphics has evolved rapidly over the last two decades. The use of 3D graphic tools is now an important part of many television, film and multimedia projects. Liu Yinwei (2015) stated that there are advantages of 3D animation: First, the process in production is different from 2D software. In the animation production, the two-dimensional software can omit the aspects of model making, bone binding, texture drawing and the process is relatively small. However, in the post-action production and scene drawing, it takes a lot of manpower and time, so Two-dimensional software has an advantage in making non-

continuous movies. In the animation production, the 3D software needs the steps of model making, bone binding, texture drawing, among others. The preparation work is more cumbersome. However, after adjusting various links, it is not necessary to use too much labor to generate animation and output lens. The computer can automatically output according to the manual setting parameters. Therefore, when making long animations or continuous animations, the advantages of 3D software are more prominent, the efficiency is better, and the cycle is relatively more. Likewise, some of the characters and scenes can be recycled after they are created. Second, there are certain differences between scenes and role handling methods. In terms of the method of generating graphics, the three-dimensional software is relatively different from the two-dimensional software. Among them, the two-dimensional animation needs hand-drawn animation to achieve the perspective change effect, and it is difficult to effectively apply it in the scene. Therefore, the role perspective can only be used to change and diversify the screen effect, so that only one by one can be drawn manually. In 3D animation, computer software, Maya software can be used to automatically calculate the effect of perspective change. After clearing the scene and character, the color level can also be different for the scene, and the lamp can be set reasonably to ensure the color is natural and rich.

Animated Short Films

For many years, 3D computer graphics were used primarily in animated short films. The experimental nature of these films was a good match for this new computer graphics technology. Smaller teams of artists, or even individual artists, could explore the use of computers to generate animation without the pressures of a larger feature production schedule. Short films provide a fertile ground for experimentation that helps drive innovation in the computer graphics industry. It is

also a great way for young animators and students to begin using their animation skills as a vehicle for storytelling.

Xu Xin (2008) mentioned that the development and application of computer graphics technology has made sufficient technical accumulation and paving for the production of full 3D animation art, during the period of Pixar Animation. Beginning in 1984, the predecessor of the special effects company "Industrial Light Magic" created the first 3D short film "Andre and Wally B". Pixar Animation Studio has been committed to the development of digital film production and technology. In 1986, it made a major breakthrough in automatically generating shadows; multiple light sources and dynamic blur effects. It produced an animated short film "Small Table Lamp" and won the Oscar for the best-animated short film. Later, it tried the character design and made the human body action. Yang Ming(2017) stated that the initial development of 3D animation(1995-2000), during which the first full 3D animated feature film "Toy Story 1" and the world's first filmless digital film "Toy Story 2" were produced. During this period, Pixar also created an experimental short film "Chess" to test the production of real skin and soft fabric. In Toy Story 2, Pixar uses a particle system (using about 2.4 million particles to make dust on the shelf), a hair treatment system (using 6 million hair covering the body of the puppy Buster), digitizing Storytelling and computer digital animations have come to the fore. Since 2004, 3D animation films have entered the heyday of their development. The United States is no longer the only producer of all 3D cartoons. Other countries have gradually entered this field, and the number of full 3D cartoons has also increased dramatically. Rising, such as "Superman Special Forces", "Shrek" series, "Cars", "Happy Feet", among others, the style of the film also presents a diversified trend. Moreover, the entire 3D animation art is on the technical platform Blooming. Ma Xiaojun (2018)

illustrated Blue Zoo animation studio that produced an animated short film "Via" that puts together different media expressions. The theme of the story is to recall the journey of life. The short film's point of view is not on the subject, but in the medium language and expression. The Maya 3D character plus the PS 2D environment seamlessly connects the 3D character to the 2D scene, presenting beautiful scenes, simple patterns, and extremely faded plots.

3D Animation Production Process

Xu Xin (2008) mentioned in his research that the creation process of 3D animation is roughly divided into five production units in order: physical modeling, material editing, motion control, rendering shading, and composite sequences. That is, create 3D data of animated characters and scenes in virtual 3D space, generate physical shapes, and then assign modeling materials and textures, and use the difference calculation to make the characters generate motion, shape deformation and expression changes in 3D space, and add lights., shots, environment effects, and others, and finally generate a complete animation by rendering into a composite sequence. Lai Yu (2016) mentioned that each module of the 3D Animation Production Process is associated with each other, and each link can work together to achieve a good animation. Models and animations, on the surface, have no relationship between them, but in special scenes, the model determines the production of animation.

Chinese Tea Culture and Tradition

Chinese tea art has a good reputation in the world and was introduced to Japan in the Tang Dynasty to form a Japanese tea ceremony. "The British science and technology history expert Joseph Needham once said:" Tea is China's fifth contribution to humanity after the four inventions

of gunpowder, paper, printing and compass. " Tea is very popular and people like to drink it.

III. RESULTS AND DISCUSSIONS

The researcher followed the 3D Animation process divided into four sub-process namely: development, pre-production, shot production and post- production. During the development process, the author planned for the concept of the animation including the story, character and art direction. Pre- production includes setting up vocal tracks, 3D animatic scene and layout. Shot production, on the other hand includes creating the animation, lighting and rendering, FX and compositing. In the post-production process, the author incorporated the sound effects and music, titles and credits and in the process of distributing the output in the target market. The 3D animation consists of seven parts: model, ZBrush advanced model, UV, texture creation, lighting design, binding, animation, rendering, and compositing. The author discussed these parts in detail using the Chinese Tea CG as the reference. Chinese Tea CG is a short animated film created by the author to let more people understand the Chinese culture. In China, drinking tea is a long-standing culture and it a sign of politeness to drink tea. Chinese are kind, friendly and hospitable people so whenever they have guests, they will always invite to have tea.

MODEL MAKING

The basic model is made in Maya software. As 3D animation software, MAYA has developed into one of the world's best 3D animation mainstream software in just a few years. Its solid program base, powerful 3D image processing performance and flexible operability provide a comprehensive and reliable 3D animation solution for 3D animation creators and enterprises. MAYA has been widely used in the industry and played a pivotal role in animated films and film special effects. All the basic models in the 3D short film

produced by the researchers were created in MAYA software including role models and scene models.

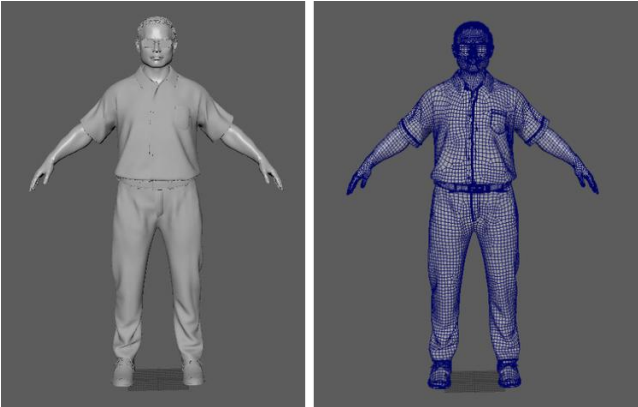


Fig.1. The Model (Right Image-the basic model is completed, Left Image- model wireframe display)

In Polygon's modeling process, the key is wiring, and the key to wiring is to do the loop. In bio-modeling, wiring can be carried out according to the radial characteristics of the organism. The loop of the eye, the loop of the mouth, and the loop of the ear can only be clarified by the characteristics of the biological muscles. Be prepared for the animations and expressions that follow. It should be noted that when laying the loop line, it is basically guaranteed to be a quadrilateral, and it is better not to have a triangle or a pentagon. Otherwise, the smoothness of the model will lead to the inequality of the model and the inconvenience of the animation. In Polygon modeling, the second key to routing is the processing of five-point points. The five-star point is the vertices of the five quadrilaterals that are collected at one point. If the five-star point appears at the position of the bone point or does not affect the animation, such as the inside of the eyebrow, the humerus, and the chin, it is modeled. The structure will be more natural and will not affect the expression animation. The key of the wiring is the position of the bone point. If one can determine the position of the bone point according to the characteristics of the creature when making

the low mold, he/she can grasp the contour of the model more accurately.

When making basic models in Maya, the researcher strictly followed Polygon's modeling specifications and prepared for the next advanced models and animations in ZBrush.

The model of the scene is that the researcher tries to restore the real tea garden environment. Seats, tea sets and characters are all true to the proportion of people and scenes. Make the whole film look more realistic, so that the viewers can clearly understand the Chinese tea culture.



Fig.2. Model face detail display

With the Maya software, after creating the model, there is a need to map the model to make the model without color and life become real. To draw the texture, users need to expand the UV of the model. This is like giving Making clothes and armor, and making clothes first use cloth, and the cloth is an unfolded piece. To make the cloth humans must measure fit the human body, the size of the cloth and the position of the pattern on the body. And the cloth is wrapped around the human body to determine the position of the pattern, and the reverse process of this process is the UV expansion of the Maya model. Only by expanding the UV of the model, one can determine the specific position and size of the texture drawn on the model. Lastly, the right clothes should be put on.

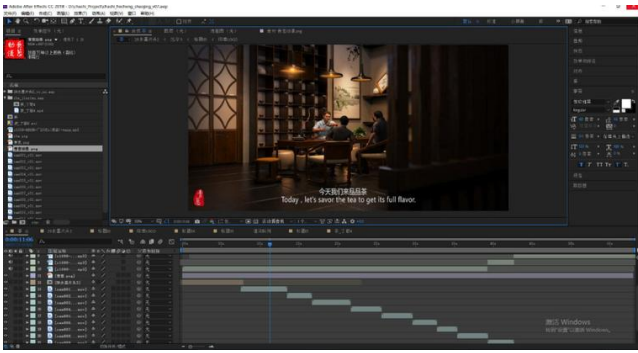


Fig.3. Synthesis part display

Use NUKE, AE and other software for synthesis and later color correction. AE's full name, After Effects, is a professional nonlinear special effects synthesis software developed by Adobe Systems Inc., a world-renowned graphic design, publishing and imaging software design company. It is a flexible layer-based 2D and 3D post-synthesis software that contains hundreds of special effects and preset animation effects. It can be seamlessly combined with Adobe's Premiere, Photoshop, Illustrator and other software to create unparalleled results.

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