

Comparison Between 3d Animation Design and 2d Animation Design

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ABSTRACT

2D animation, after a long time of development, technological innovation, and animation model changes, gradually built the animation industry chain. The commercial value of 2D animation was improved well, and animation as a kind of cultural communication form for young and old, has been formed in multinational cultural characteristics. This time under the influence of 2D animation, 3D animation was born. In response to the needs of the times and people's sensory stimulation needs, Three-Dimensional technology creates a more three-dimensional effect. However, at the same time, to improve the three-dimensional picture, the relative cost and time consumption are same, whether it is two-dimensional animation design or three-dimensional animation design. Their respective advantages and disadvantages have a long way to go in the future.

Keywords: *2D animation, 3D animation, Design, Practicality*

1. INTRODUCTION

2D animation has a history of development, and its design is its own system. The design of 3D animation is based on 2D mode, with more detailed and sophisticated processing results. It can be said that the fundamental difference between the two lies in the spatial dimension. The height has been adjusted to make the picture feel more real and let the viewer fall into it. The design differences between 2D and 3D animations can be analyzed from the concept, production process, and characteristics. Animation design must always capture the audience's attention, embody the authenticity of the animation while not forgetting to create classic characters, and give people spiritual inspiration. Whether it is 2D or 3D design, it has its own characteristics. This article will substitute the corresponding animation case. The explanation and comparison of the differences between the two are helpful for innovative thinking in animation design.

2. COMPARISON OF DESIGN CONCEPTS BETWEEN 2D ANIMATION AND 3D ANIMATION

Early by hand, 2D animation a frame and a frame connection into the animation scene, the background of the animation is a relatively static state. However, the

corresponding image objects, the character is to move slowly, with the aid of the transparency film for drawing this vector, by superposition technique to render pictures, the animation information is complete, but relatively lack realistic. At present, 3d images can be simulated with the help of computer form, which improves the authenticity. However, the images can only tilt towards the 3d state but cannot truly compare with 3d.

Although the three-dimensional (3D) animation is very three-dimensional, no matter what angle of the picture or the geometric distance away from the screen, it should not affect people's sensory experience too much. At the same time, three-dimensional animation (3D) is still inseparable from the original graphic design. No matter how gorgeous 3D animation lighting is, the graphic art design is inseparable. This research which can take the domestic successful 3D animation "Nezha", for example. Its animation design is inseparable from graphic design and flat character design. Meanwhile, there is a transition from the plane (2D) to 3D in animation modelling instead of directly forming a 3D scene. For example, "Snow" could not be more familiar. The details of each character make people feel lifelike, more vivid than its character standing in front of the audience; it is not difficult to find under careful observation. However, the mirror lens is still 2D design,

and it can admit that the 3D than 2D is more sophisticated but said 3D would completely replace the two-dimensional animation mode until it disappears. That is an unprofessional assessment^[1].

3. COMPARISON OF 2D ANIMATION AND 3D ANIMATION COMPOSITION

3.1 Characteristics of 2D animation composition

The whole film of two-dimensional(2D) animation works is usually composed of ten more scenes. These beautiful background pictures of natural scenery, household arrangement or hazy dream are all drawn by the staff according to the script requirements and the director's intension. Different types of film scenes are drawn with different degrees of delicacy. Acclaimed audiences have always loved two-dimensional (2D) animated films supervised by Miyazaki Hayao for their meticulous backgrounds and soft and bright colors. Those original scenes are mostly taken from real natural scenery photos or directors' imaginations in Japan and even across the country. Artistic modification and creation on this basis always give people a feeling of hand-painted dreamy background.

Because 2D animation scenes are static two-dimensional (2D) planes, in animated movies, producers usually draw separate distance layers: first, the sky in the distance, the white clouds in the sky above, and the second are thick. Thick green trees can imitate the wind when they shake. In the vicinity of grass, fields, and rocks, sometimes the scenery will precede the character, while the other character is only in the background. In this way, the film scenes generated by the layer-by-layer celluloid occupies most of the development of two-dimensional (2D) animation. Until 1964, the United States Bell Laboratory invented the new technology of computer film production, thus providing favorable conditions for computer animation. In modern society, various kinds of software can help 2D animation creation very well. The emergence of network animation - Flash, animation creation closer to the life of ordinary people. Throughout the development of two-dimensional animation painting techniques, multiple layers superimposed to produce better background motion have never been abandoned.

3.2 Characteristics of 3D animation composition

There are apparent differences between scene design of 3D animation and scene design of 2D animation. Computer 3D animation has a unique advantage in representing the physical space of a scene. 3D animation is versatile and easy to use. Because the

scene is constructed by precise three-dimensional(3D) design, without artificial feeling to build the scene, it can simulate and reproduce the realistic style of the primary world^[2].

The image clarity and sense of space of the foreground and background of 3D animation, whether designed with natural objects or 3D virtual technology, is always similar to the real world. Because the scene design fully complies with the scientific perspective rules, whether it is placed in a physical object to perform Shooting or 3D modelling, there will be no distance error due to the increase in the number of frames taken.

4. COMPARISON OF ACTION DESIGN BETWEEN 2D ANIMATION AND 3D ANIMATION

The character's action design is also a prominent aspect of comparing 2D animation and 3D animation. The action design in the animation is much exaggerated and distorted than the shooting in real life. Hyperbole is a commonly used artistic treatment method in animation, which is almost everywhere. The so-called hyperbole refers to the partial or all forms of the characters' exaggerated to achieve strong artistic effects under the premise of preserving the characteristics of animation modelling. Transformation is an artistic technique commonly used in cartoon modelling and character performance [3]. The so-called deformation in animation modelling refers to the deformation of the body structure of the animated character to make it more vivid and exciting and more in line with the plot requirements.

4.1 Action design in 2D animation

Because of its plane characteristics, two-dimensional(2D), animation can often use more exaggeration than three-dimensional(3D) animation. The exaggeration of character modelling in two-dimensional(2D) animation has evolved from imitating real characters and animals for a long time. This way gradually developed into a cartoon style of freehand brushwork painting. Those characters with a few strokes of outline and critical parts, full of fun, highly personalized leap on the screen, walking, running, complete "concise" various movements. 2D character animation actions can change exaggerated forms, stretch, and curl arbitrarily, often because of the graphic nature. People dare not imagine it as reality; this kind of unintentionally fussy exaggeration is unrealistic, even for the frontal portrayal of characters. There can be exaggerated and bloated figures and inconvenient steps.

Two-dimensional (2D) animated characters pursue

perfection while striving to consider the details of the form. After all, every picture needs to be meticulous, especially the character's clothing and accessories. Therefore, after the character moves, it is necessary to dig deeper into the movement relationship of the accessories' position, angle, and shape. This caused a considerable workload.—The contradiction between disproportionate efforts and gains has become why few people are willing to bear such a strenuous work style. However, great works are produced when a great deal of attention is devoted to the pursuit of fine details while the character image is maintained with great precision. Japanese animation, represented by Miyazaki Hayao, has always been admired by a broad audience for its realistic style and fine detail. The reporter again laughed that Miyazaki Hayao "soul-blowing" this lens using computer technology in the interview. Miyazaki Hayao says he is a hitchhiker, and as long as he can finish painting, he makes up his mind to do it well, even if it takes a little money. It can involve computer technology, unless hand-drawn cannot be very good to complete the lens, such as water ripples and other shapes. Nevertheless, it must be specially set up by the computer personnel's computer imaging department to take over the completion of drawings after the work was finally sent to accept processing. In addition, in the pre-production, the working group issued a "no 3D" statement. Strongly advocated that the Ghibli studio hand-drawn members should not use computer painting because this will make people's hand-drawn technology decline. The painting effect is not good to discount significantly.

4.2 Action design in 3D animation

In 3D animation, the first impression often reminds the audience of recalling and comparing similar things in daily life due to the three-dimensional form. Is the ugly fish in Finding Nemo the same as the primary thing? Are the size and shape up to standard? Are the colors so exaggerated that the animators doubt their simulation skills and lose patience? In addition, the movement of the flying animals, the formation of their wings in the sky; The contours of running beasts, strong limbs, and the flying sand and stones lifted when catching prey will not stand out in the picture because of being out of reality. Suppose the character image in the 3D animation is exaggerated and distorted, compared with the physical object. In that case, we feel like a lack of knowledge of the student's work, or a purely alternative artist engaged in his creative performance.

Today's 3D animation software is compelling. As long as people can think of it, it can almost be achieved. With the rapid development of 3D technology, for today's filmmakers, using their imaginations to tell stories, two-dimensional (2D) animation can give

people the feeling that it is often exciting and eccentric. Furthermore, 3D animation from itself is the natural and artistic style serious, the production of three-dimensional(3D) animation is very time-consuming. The creator should experience digital production and have one of the high-speed computers as a hardware device. All of these conditions make the production technique is quite expensive, so only in the case of very necessary to consider ^[4].

5. A COMPARISON BETWEEN CREATORS OF TWO-DIMENSIONAL ANIMATION AND THREE-DIMENSIONAL ANIMATION

5.1 Comparison of costs and benefits

Due to the constraints of cost, personal creation tends to be two-dimensional animation short films. Although there are three-dimensional animation short films, few are high-quality; As an innovative technology experiment on a certain level, 3D animation needs a large amount of capital cost as support. High-quality 3D animation works still need a certain amount of time. In contrast, full-length 3D animation must be completed by the concerted efforts of hundreds of employees of animation production companies with considerable strength for several years.

Animation takes a lot of workforce and material resources, so both the producer and the original author are conscientious before making it. Most Japanese TV cartoons are made first and then based on the sales of comics to decide whether to make animation. For example, the famous TV cartoon "Doraemon" is based on Miyazaki Hayao's comic book. After its release and best-selling for several years, it changed and met with the audience in animation, which has more market potential and continued to sell well. Whether comic books or cartoons, animation images are always two-dimensional. Although two-dimensional(2D) images are easy to remember, with the emergence of three-dimensional derivatives, audiences are closer to the animation images in their minds. The position of two-dimensional images in their minds is further consolidated. Thus, three-dimensional(3D) is more affinity, rather than flat in the image of the paper.

Animated images do not look like live shows. After reading the script, add the actor's feeling to the sense provided by the script, and the actor will make a second creation to enhance the performance value and story expression. The animated characters are, at best, the animation that the director himself and other follow-up staff use to play with imagination. There is no spark of temporary surprise or inspiration, and when there is a spark, it must be something that everyone feels worth doing. Although the producer only needs to redraw the

scene, it takes a long time to turn inspiration into a practical product. Because of the complexity of this internal process, the number of people, the need for communication and cooperation. Unlike popular commercial animation, computer-generated animation, ink animation, shadow animation and other artistic animation, although good-looking, but to reproduce on the big screen, there is still a way to go. For example, ink animation is an art animation, cannot form a pipeline operation, production costs are high. Because of the complexity of the artistic animation production process, these animations are mainly manifested in visual effects, conveying the joy of metaphor. The story is often straightforward. Making an animated movie requires much money, but none of it is a remarkable story, and the rewards are small. Even in Europe, 2D animation is only played in salons and mainly in short pieces. Japanese two-dimensional(2D) animations, such as *Castle in the Sky* and *Spirited Away* by Miyazaki Hayao, appear on the screen. However, they are story animations with thought-provoking plots and delicate psychological descriptions. In the United States, animation films mainly based on 3D animation have rich actions and character expressions, which are much better than two-dimensional animation in terms of the balance between production cost and income and the performance before the screen.

5.2 Comparison of the size of the creator team

There are two mainstream creative teams in the animation market, and one is a large animation production factory, the other is more independent animation people or small teams.

5.2.1 Animation factory

Many people know *Toy Story*, *Finding Nemo*. These big names are all associated with one name: Pixar Animation Studios. In May 1991, Pixar took a historic step in establishing a partnership with entertainment giant Disney. In 1995, the world's first fully 3D animated film, "*Toy Story*", was released in the United States. *Toy Story* mobilized more than 100 million U.S. dollars and took four years to complete. Pixar's computer skills were fully demonstrated in *Toy Story*. Since then, Pixar has used computer technology to let the animation studio cooperate with Disney to make 3D animation into a cash cow for animated films. These 3D animations were born with high costs and production hats, and there are many expectations every time they are released.

Fox's Blue-Sky Studios is also one of the top animation studios in the industry, creating *Ice Age* with advanced proprietary CGI software, widely regarded as the most professional ray tracking software. Square Enix's *Final Fantasy* is a stunning re-creation of an

almost life-like skin and hair system that cannot be bought without a big budget^[6].

It can be seen that it is difficult to develop great works of film and television animation without strong economic strength, which determines that large animation companies create most 3d animation. Individuals and small groups can only feel helpless.

5.2.2 Independent animator

With the widespread use of computer animation technology, personal workstations in the hardware level of the continuous improvement, now independently to complete a small animation cost is no longer a dream. Small studios and independent artists are increasingly joining the ranks of independent animation producers. The most significant characteristic of independent animation producers is that they make full use of paperless technology to produce animation and pursue originality. Due to the limited human and material resources, the low cost of TV broadcasting and the high cost of the early promotion and publicity of cinema animation, they all make animation at a small cost. However, this kind of creative mode, which has been relatively mature overseas, is still in its infancy in China and develops slowly. Many producers are not rewarded for the hard work they put into their work. In addition, it is difficult for independent creators to develop without sufficient level to establish themselves in the animation industry due to the uneven state of technology and relatively low operating costs. Although there are many difficulties and resistance above, the independent production of animation has been a trend. At present, many excellent small studios and animation artists have emerged in China^[8]. China's animation market and animation demand have great potential, and China's independent animation artists will have more room for development. Although there are not yet many independent animation artists, shortly, this group will inject more emerging forces and grow stronger.

6. CONCLUSION

2D animation and 3D animation are two different and controversial animation forms. 2D animation can be said to be the most intuitive form of animation. The two-dimensional animated characters displayed on the plane are not only easy to attract children's attention but also can cultivate children's interest in drawing from an early age. 3D animation relies on technological progress and is a product of high-tech productivity. Every time a new 3D animation work is created, it represents humankind's most advanced level of computer animation technology. However, when technology is above art itself, those high-tech animation works that only pay attention to its application cannot ignore the ideological and story level of animation works

themselves. After all, the animation is a form of film and television; the story and ideology are the first. In addition, we can continue to talk about the rapid changes brought by science and technology. Suppose the creators can carry out a careful screening of scripts and make films carefully. In that case, both two-dimensional animation and three-dimensional animation can achieve good ratings and box office results.

AUTHORS' CONTRIBUTIONS

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