

Research on the Application of Computer 3D Digital Technology in 2D Animation

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Abstract: Based on the analysis of the difference between 2D animation and 3D animation, this paper analyzes the digital advantages of 2D animation. Taking ink animation as an example, this paper studies the application of 3D computer digital technology in 2D animation design, which can not only better express the artistic effect of ink painting and realize the creation of freehand digital ink animation, but also help with the simulate on of computer software plug-in. The fluid state can be simulated to achieve the effect of ink smudging, and computer software can be used for three-dimensional modeling. Material simulation can make traditional ink animation from no perspective to a sense of volume.

1 INTRODUCTION

In 2D animation, the development trend of today's 2D animation is to present the effect of art technology processing by using advanced technical processing measures and combining with related art forms, so as to improve the artistic expression effect of animation.

Driven by the development of digital technology, the two-dimensional animation design introduces digital technology, and the computer carries out the relevant processing of two-dimensional animation character modeling, scene drawing, coloring, post-special effects, etc., in order to reduce the cost of enterprises and improve the core competitiveness of enterprises.

2 THE DIFFERENCE BETWEEN 2D ANIMATION AND 3D ANIMATION

From the perspective of basic production methods, two-dimensional animation refers to the first animation design staff to draw the beginning and end of a fragment of two scenes, and then animation auxiliary workers to draw the connection between them, and then sort and stroke and color, and finally made frame by frame.

3D animation refers to the modeling and production of the figure drawing through the 3D production program. First, a virtual reality environment is created in the computer, and then the designer can create patterns and images in the three-dimensional environment of this virtual reality according to the shape and size of the object displayed, and then set the moving track of the modeling, the motion orientation of the virtual reality camera and other animation technical parameters according to the requirements, and finally assign certain materials to the modeling according to the requirements Plus lighting. And after all this is done, it can be automatically operated by the computer to make the final video.

Technically speaking, the entire creation process of two-dimensional animation requires huge manpower, capital and time, and requires high-tech art ability. In the painting stroke, because the creation time of long-form animation is relatively long, it also needs a special color mixing agency to adjust the color to ensure that a certain character in the animation is consistent in the shade processing. Although the threshold to enter the 3D animation technology is relatively small, it still needs to master the technology and skilled use of long-term unremitting struggle, and needs to constantly master new skills with the development of software technology.

The existence of 2D animation and 3D animation is inseparable. 2D animation and 3D animation

space painting techniques are actually simulations of the real 3D space environment, because the maps in 3D animation are two-dimensional, while 2D animation is depicting the real 3D space, so only by combining these two skills can we effectively simulate the real space, so as to create animations with more visual effects.

3 ORGANIZATION OF THE TEXT ADVANTAGES OF APPLYING DIGITIZATION IN 2D ANIMATION DESIGN

The emergence of digital painting art is based on the development of computer graphics technology. From the end of the 20th century to the beginning of this century, the rapid development of computer graphics technology gave birth to digital painting software. This complex and highly analog simulation software, together with hand-drawn works, is fed into a computer device to create a new painting product - digital painting.

Digital art takes computer as the means to complete the most basic carrier of art works, and uses computer, digital board, and other equipment as well as supporting computer art programs to operate and create art. Works exist in the form of digital graphics or images that are easy to use, modify, copy, store and transfer. The biggest advantage of digital painting is also its electronic characteristics, which is easy to transmit and store. Graphics and image materials obtained using 2D and 3D scanners, cameras, smartphones, digital cameras, and other digital media tools can also be better combined with digital image processing equipment to process graphics and images or generate different image effects and textures, so it has different characteristics and advantages from traditional painting.

With the development of graphics and imaging technology and the improvement of computer hardware and software technology, this form of painting is gradually becoming mature, and its application field is also extensive. The research scope of digital art mainly involves graphic design, game art design, film and television animation, multimedia product design, illustration, architecture, advertising, industrial modeling, personal CG, photography and other design fields, and it is also a rich discipline that attaches equal importance to aesthetics and technology and constantly accumulates experience.

On the basis of changing and compiling the animation script, the early hand-drawn two-dimensional animation was completed by character designer and picture designer, and the shooting script was painted by director. The action designer described the relevant scenes of the animation and made the picture into celluloid, then painted it with color, and the animation production desk completed the recording work. After the completion of editing, sound and text production.

In two-dimensional animation design, digital technology and digital software are used to realize two-dimensional animation design, and its advantages are mainly reflected in the following aspects:

3.1 Reduce Animation Production Costs

Two-dimensional animation production needs a lot of paper and pen, and the consumption of consumables is large. The use of digital technology in two-dimensional animation design can directly complete the drawing of character pictures and character original paintings on the computer screen, which can effectively reduce the cost of animation production;

3.2 High Information Transmission Efficiency

The files of traditional hand-drawn thought-guided animation need to be transferred between various cities, which takes a long time. The application of digital information technology in 2D animation creation can make animation files stored in small compressed packages, and realize data exchange and transmission through the network, breaking through the limitation of time and space;

3.3 Animation Drawing Quality Is High

In general 2D animation design, major editing problems must be returned to the original step or corrected, in order to complete the inspection, scanning, coloring, merging and other operations, thus affecting the quality and effect of animation rendering. When using digital technology, it can directly use computer software or electronic tools to complete synchronous adjustment and dynamic detection, which greatly improves efficiency.

4 RESEARCH ON THE APPLICATION OF COMPUTER 3D DIGITAL TECHNOLOGY IN TWO-DIMENSIONAL ANIMATION DESIGN

4.1 Use Computer Digital Technology to Express Ink Art Effects

At present, the technologies of ink and wash images can be realized in digital images, which are as follows: First, the hierarchical display technology of two-dimensional Animation. The original ink painting technology uses physical materials such as transparent superposition and special film technology to express the visual effect of ink and wash. Two-dimensional drawing software such as animation and TVP can render ink and wash images in layers; The second is the three-dimensional animation particle image, using the script technology to achieve more complex ink smudging image; The third is the 3D animation ink rendering technology, which uses the printing water material on the 3D software to obtain the ink effect, which is also suitable for the creation of meticulous characters and flowers; Finally, the video post-ink special effects technology is the use of existing video and picture materials processing, and then the formation of the latest water printing material.

With the rapid development of computer digital technology, animation creators rely on the application technology of computer software to recreate freehand digital ink animation works, which has become a new idea for creating ink animation.

4.2 Use Particle System Plug-in to Simulate Fluid State to Achieve the Effect of Ink Smudging

The computer digital technology plug-in uses the particle system to simulate the fluid state to achieve the effect of ink smudging. The liquid ink fume plug-in Turbulence FD based on C4D platform is used to simulate the effect of ink fainting.

The TFD simulation pipeline divides the three-dimensional space into one pixel grid, forming a three-dimensional grid, and decomposes the three-dimensional space without the concept of pixels. The simulated fluid will have different clarity through the size of the pixel grid set. At the same time, by adjusting the transmitter temperature, density, fuel and other influencing factors in each

pixel cell, the screen is presented with smoke, flame and so on. The ink effect is simulated by modifying the color and density of the smoke.

Through the simulation of TFD, we can see the flow effect of ink as a liquid under the influence of gravity, wind, turbulence and other physical mechanics. CCTV classic ink advertisement "Believe in the power of the brand" The use of plug-in generated smoke ink effect is very smooth and elegant. This can not be done by traditional hand-painted two-dimensional ink animation, which requires the simulation help of computer software plug-ins.

4.3 Modeling Correlation Method

At present, according to the differences between image acquisition sources and image acquisition data sources, the modeling methods mainly include the following :

1) The Model Using Hardware Equipment

Most of these modeling methods need to use 3D scanner, which can quickly and accurately model the object after laser scanning. However, these means are not only expensive hardware facilities, and not flexible, generally only applicable to some specific scenarios;

2) Algorithm-Based Modeling

This modeling method can realize the automation of modeling. Depending on whether the object to be modeled exists in the real world, different algorithms can be selected based on multiple or one image. But the feature point matching of multi-image modeling needs a lot of human-computer interaction to complete, and the automation process is complicated. If you want to use the algorithm for modeling, it is not only slow, but also to optimize the performance of the algorithm, otherwise it will lead to modeling failure.

3) The Model of The Model Software

According to the complexity of the model software function, it can be divided into small scale, medium scale and large scale. Small ones include Poser、Rhino、COOL 3D、LightScape、Bryce , etc. The medium-sized ones include 3ds Max 、LIGHTWAVE 3D, etc. Large modeling software include SOFTIMAGE, Maya, Houdini, etc. Using modeling software modeling is convenient and quick, but it is necessary to be familiar with the modeling software and have a general understanding of the object.

Table 1: Advantages and disadvantages of different creative methods.

Creation method	Use software	Advantage	Insufficient
Digital painting	PS, painter, Sai, ArtRage, Kritia	The effect of ink painting is highly controllable, and the space for creators to play freely is large.	The creation workload is very huge, and requires creators to have a deep artistic skills, and a single lens language
Post-film method	After Effects, Nuke, Premiere, Audition	Compared with the other two, the time cost is relatively low, and the generality between the later software is high.	Some software needs to write program expressions, which has high comprehensive requirements for creators.
Three-dimensional modeling method	3Ds max, MAYA C4D, Blender	Can better support the production of 2D and 3D ink animation	The time of rendering output is very long and the comprehensive workload is large.

4.4 With the Help of 3D Modeling Material Simulation, Traditional Ink Animation Can Be Changed from No Perspective to Volume

Two-dimensional animation can achieve three-dimensional modeling through computer software, and material simulation can also achieve the volume of traditional ink animation without perspective effect. Among them, material modeling generally refers to the three-dimensional environment using Maya, 3Dsmax and C4D three programs.

Due to the use of network technology to find a large number of traditional Chinese painting brush samples and map them to achieve the imitation of ink painting results, the mapping was directly completed in PS, Expresii and other application software, which overcame the phenomenon of over-dependence on traditional Chinese ink painting technology in ink animation to some extent.

Different from the traditional ink painting, which requires uneven and dry, the computer digital software can use the corresponding plug-in to draw lines in ink painting, so as to show the perfect characteristics of figure painting and flower-and-bird painting. In general, taking two-dimensional ink animation as an example, the expression of pen and ink language has great malleability, which can not only express the expression of pen and ink language itself, but also use the method of computer digital technology to assist two-dimensional animation to express the entire artistic conception of traditional Chinese painting.

5 CONCLUSION

With the rapid development of computer 3D digital technology in recent years, it has been widely used in the field of animation. Two-dimensional animation itself has a huge advantage in the application of practical digitization, through the advantages of digitization in which the use of computer 3D digital technology to assist production, two-dimensional animation can complete the iteration of technology on the basis of losing its meaning.

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