Research on special effects technology under digital technology

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Abstract: After a hundred years of development, the film and television media industry continues to mature, forming a mature set of visual language arts. Among them, the development of film and television special effects technology is particularly outstanding, which presents a lot of breathtaking pictures for people, and contributes to the development of modern film and television media. Film and television special effects are based on computer image generation, digital image processing, virtual reality technology and animation synthesis technology, special processing of the lens to present special effects technology. Starting from the concept and development of film and television special effects, this paper probes into the specific realization method and operation process of film and television special effects technology under digital technology, and makes a comprehensive analysis and research on film and television special effects technology.

Key words: digital technology; Special effects; Technical analysis

1. Overview of special effects

1.The concept of special effects

Film and television Special Effects is short for film and television Visual effects, the English name is Visual Special Effects, abbreviated as "VFX". To put it simply, film and television special effects is the application of computer image processing technology to produce images, its significance is on the one hand for the film and television works to present a more appealing picture, on the other hand, it can also reduce the cost of film and television production, while avoiding the production process of relying on actors to complete difficult actions, improve the security of film and television production.

2. Development of film and television special effects technology

Film and television special effects technology is accompanied by the continuous development of film and television technology. In the early days, computer technology was not widely used in the film era, and special effects were mainly completed by simple operations such as editing and collage, which were mainly used in makeup, scene-setting, fireworks production and so on. With the development of computer image processing technology, the visual presentation effect of film and television special effects is becoming more and more shocking, and the scope of application is also increasing. It is not only used in film and television works, but also widely used in advertising production.

2. Film and television special effects production process

1. Scene construction

In the production of scene special effects, the main content is to deal with two kinds of character face modeling and environment construction, and establish a scene that does not exist in the world.

2. Character face modeling

Character face modeling has always been an important content in film and television production, since the birth of the movie, can be divided into two forms: one is special effects makeup; The other is "digital plastic surgery".

(1) Special effects makeup

The main steps of special effects makeup are: first, draw a sketch and create a simple character model through computer 3D modeling technology; Secondly, the head of the actor is turned over to get the cast head model of the actor, and then the computer technology is applied to the cast head model for sculpture, the application of makeup technology to paste the fake skin to the actor's face, and the details are fixed by brushes and colors. The current special effects makeup technology can carefully treat the bones and skin textures of the actor's head, presenting a realistic effect.

(2) Digital cosmetic surgery

Digital plastic surgery is a new technology, which is realized by CG technology such as motion capture, 3D modeling and face capture. The realization process is to design mark points on the face of characters, combine with high-resolution head-mounted camera equipment and pose capture system, capture the tiny facial expressions of actors, track the facial marks, and change or reconstruct the character image with 3D software.

(3) Environment construction

Generally speaking, environment construction mainly includes scenery and physical simulation of two jobs, the purpose of scenery is to build physical background to meet the needs of real shooting, physical simulation mainly through the "green screen", "blue screen" to achieve, to create a 1:1 scene for the later capture as the basis.

3.computer integrated technology

Computer synthesis is an important part of special effects production. With the popularization of computer technology, synthesis technology has gradually matured. The combination of synthesis technology and 3D technology has promoted special effects into an era of

high efficiency and high resolution, making special effects more lifelike, gorgeous and exquisite.

(1) Dcomprehensive technology

After Effect is a professional 2D synthesis software used in film and television special effects technology, which mainly realizes image synthesis through layer processing. The image is extracted and processed by layer processing. Different microform techniques can be used for compositing with different difficulty levels. Special effects such as "mask track", "masking" and "border" are used to fine-tune the details, so that the real scene and special effects are perfectly combined, making the effects that can be achieved by special effects technology more diversified.

(2) Computer 3D animation production

Software such as Dmax, Maya, Cinema 4D, Realfow, etc. are commonly used in 3D synthesis software for film and television special effects. Each software has its own technical advantages, such as 3 Dmax's rendering technology and simulation function is more prominent, the software's powerful drawing, texture and modeling tool set, as well as smooth multi-application workflow makes its rendering function more prominent, in the scene simulation, architectural design, environmental design application is more common, Maya's most prominent feature is polygon modeling, At the same time, the application of the new algorithm to optimize the performance, with its multi-threaded support function to improve the production efficiency, the advantages of multi-core processors to the maximum, in the film and television production, game development and other large-scale production field has a wide range of applications. Cinema 4D has the characteristics of high efficiency and simplicity, there are many more powerful modules in graphic design and user interface design, so it is widely used in film post-packaging; The biggest feature of Realfow is to make the picture more realistic, and to deal with rivers, waterfalls, flames, etc., more real.

3D animation synthesis technology has important application value in the post-special effects of film and television. First of all, three-dimensional synthesis technology should be applied to the construction of scenes and models. The main application of Polygon modeling method, but also non-uniform rational B-spline modeling, subdivision surface modeling. Compared with NURBS model and polygon model, subdivision surface model combines the advantages of both, ensuring the model fluency, but also has a flexible topology.

Secondly, materials and light are added to the scene and model. Materials should be selected and processed according to the physical characteristics of color, transparency, environment, self-illumination, convex and concave, highlight, mirror, etc., so as to make the material processing more realistic.

Animation processing, that is, let the model "move" up, animation processing includes model animation processing, virtual lens processing, bone animation, expression animation, etc., through the key frame and trajectory to achieve. Through the virtual camera to set the lens Angle, height, Angle, virtual and solid degree, distance, depth of field, focus and other parameters; Can use live actors facial expression capture, motion capture to realize the bones, expressions and other details processing, through the simulation of natural particles and fluids, such as smoke, such as explosion, such as flame, water, wind and so on to make the scene "move" up.

Finally, render and output 3D models and scenes. The image sequence file with Alpha channel is output, and then imported into After Effect software to synthesize with the real scene. To better achieve the overall artistic expression of the picture and visual impact effect, special effects should be designed according to the needs of the plot to strengthen the theme of the work, render the current atmosphere, and increase the appeal and influence of the work with the help of related audio and sound effects design. Sound special effects are generally completed by the collaboration of mimicricians, recording engineers and mixers. They capture and record special sounds such as explosion, crushing, water flow, singing and natural sounds such as voice dialogue narration and background music, and become music and sound effects that can be used in film and television works through editing and processing of mixing. Finally, the color palette designates and adjusts the style according to the overall effect of the picture of the film and television works, and makes the final modification and improvement according to the theme and environmental effect of the work. Through the collaborative work of multiple parties, the creation of the film and television works is finally completed.

3. the importance of film special effects technology in digital technology

1. Re-establish the concept of time and space

The application of special effects technology has revolutionized the concept of time and space in film and television works, enabling film and television creators to reverse time and space, which has also ushered in a golden development period for a series of surrealist films, science fiction films, fantasy films and thrillers. For example, "Bullet time" in the Matrix breaks the traditional film's restrictions on time and space, and adopts a special way. Through computer technology, the speed of the screen can be changed, so as to achieve the purpose of slow motion or time standing still. This kind of romanticized lens processing makes the time and space in the film and television work be lengthened, the scene and space are enhanced, and the aesthetic effect is improved. In the Matrix, more than a dozen cameras were used to ensure the effect at the beginning of shooting, and virtual reality and holographic technology were applied later to present the audience with a wonderful time travel effect.

2. Innovate the traditional audio-visual language communication content

Special effects technology makes the audio-visual experience more shocking. 3D audio-visual special effects, Dolby sound effects, virtual reality spatial experience, interactive audio-visual and other technologies have created a more three-dimensional audio-visual effect, fully mobilize people's senses, let the audience enjoy a more stimulating visual experience, making the creation of film and television has

more possibilities. In short, the technology of film and television special effects makes the audio-visual experience not limited to the two-dimensional plane, but allows the audience to enjoy a more advanced audio-visual experience through three-dimensional stimulation.

3. Reform film and television post-production

The development of special effects technology has provided more possibilities for film and television post-production. In the later stage, the video is optimized through color and light and shadow technology, and the contrast, transparency, sharpening and white balance are adjusted to make the video picture present a more beautiful picture. The color and light and shadow technology enables the creators to have a stronger expression of light and shadow, and can convey a more realistic aesthetic language.

Film and television special effects in the digital age have led to the reform of film and television post-production. Film and television works are no longer like traditional shooting, which involves scene and shape design first, then shooting by photographers, splicing by editors at the editing table, and finally screening. This kind of traditional shooting method is cumbersome and inefficient. In the digital era of film and television special effects, first of all, artists use 3D software to model and design scenes and characters, display the early concept map in an all-round way, optimize the visual effect of the picture, simplify the later work flow, and can be adjusted at any time according to needs. When shooting, the 3D HD camera can complete many scenes that can not be achieved by traditional shooting techniques, and present better picture effects. In the later stage, the use of computer processing technology, special effects synthesis technology for film editing and synthesis, for film and television post-production personnel to provide more creative platforms, and simplify the post-production process, improve the quality of the overall film and television works. Under the digital technology, film and television special effects technology has revolutionized the means of film and television post-production, presenting many scenes that are impossible to see in the real world in front of people, creating a dream world that makes people infinitely fascinated.

4. Improving the audience's feeling of watching movies

Film and television special effects technology in the digital environment has brought great changes to the film and television industry. In IMAX large-screen theaters, the advent of 3D and 4D digital films has greatly optimized the visual presentation effect of films, bringing the audience a strong sense of immersion and impact, and enabling the audience to interact and communicate more immersive with the film picture content. Such as Avatar, King Kong, Hulk, mutants, robots, zombies and so on, these are unimaginable human roles, the use of virtual reality technology to build a boundless alien space, to bring unprecedented visual feast to human beings. Digital special effects technology also breaks the boundaries between movies, TV and the Internet, integrates multiple entertainment modes, and provides people with multi-level experience.

Epilogue

With the development of computer technology, film and television special effects technology has been continuously optimized and entered the digital era. With the support of 3D animation, post-synthesis, modeling, light distribution and other technologies, the possibilities of film and television special effects are more extensive, and the pictures presented are more visually stunning, allowing creators to enjoy a broader creative space, and allowing the audience to enjoy more impact visual pictures. So that the viewing experience is constantly optimized. In recent years, with the support of digital technology, special effects technology has been continuously optimized and upgraded, and the audience has received a very good response. In the future, special effects technology will further help the development of the film and television industry and further enrich people's entertainment life.

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