A Study on visual spectacle construction in digital effects movies—A case study of "Avatar"

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Abstract: For the movie audience, visual spectacle construction can sometimes strengthen the emotion and plot in the movie through incredible or shocking visual effects, deepen the emotional connection between the audience and the movie characters, make the audience easier to empathize and feel empathy, and satisfy the audience's "curiosity" psychology of the unknown world. Film digital effects play a key role in creating visual wonders. Through the use of digital technology and visual effects to create compelling and breathtaking scenes and plots, satisfy the audience's desire for visual spectacle. Such as the film "Avatar", through digital effects to create a beautiful planet Pandora, bringing the audience into an incomparable and bizarre fantasy world. This article will take the movie "Avatar" as an example to discuss the spectacle construction in the digital effects movie.

1. Introduction

"Seeing" is the first feeling need for the relationship between human beings and the world [1]. Therefore, visual impact is the most direct impact that digital special effects bring to the audience compared with traditional films. It includes the color, lens use, picture design and other aspects of the film, leaving a deep first impression on the film audience. Digital effect is the basic technology of digital film, which surpasses the traditional special technical means to separate the image from the ordinary scene, synthesize a new and beautiful image that is difficult to capture in real life, create a novel visual effect, and bring the audience a surreal image spectacle. [2] Spectacle construction in digital effects film has many meanings. First of all, by creating visual wonders through digital effects, the film can visually show a high level of technology and production quality, improving the quality and level of the overall film. At the same time, through the visual spectacle, the film can more vividly express the emotion and convey the theme, increase the audience's sense of investment in the story, and strengthen the narrative effect of the film. Second, digital effects offer filmmakers the opportunity to expand their creative space. Through fictional Settings and characters, creators can explore more fantasy, science fiction or historical Settings, break through the limitations of traditional shooting, create abstract, surreal effects, and promote the innovation and development of the art of film. Third, the development of digital effects has promoted the innovation of film technology. In the pursuit of more realistic and complex special effects, the industry continues to explore new technologies and new methods, which not only includes technological innovation in visual effects, but also promotes

the application of new technologies such as real-time rendering and deep learning, which promotes the scientific and technological development of the entire film industry. In general, the construction of wonders in digital effects movies is not only to achieve technical breakthroughs, but also to enhance the artistic level of the film, attract the audience, and promote the development of the entire film industry. This construction provides a broader creative space for film creators, and also brings more rich and profound film experience to the audience.

2. Concept and classification of digital effects

Digital effects mainly refer to the special effects completed in digital post-production with the help of computational graphics and image generation technology, including computer-generated CGI [3]. It mainly includes the simulation of 3D virtual scene, the drawing of image mask, the modeling of character, the color adjustment of the lens, the atmosphere rendering of the lens screen, the post-processing of the lens screen, etc [4]. There are several different classification methods for digital effects, such as "according to the relationship between the production of special effects and the real image, it can be divided into: supplementary composite, creative composite, and special processing." According to the relationship between the main body of the special effect and the real scene, it is divided into two dimensions and three dimensions, that is, in the picture synthesis, whether the two images produce plane movement or three-dimensional movement [5]. According to the different generation methods, it is mainly divided into computer graphics technology, post-special effect software processing technology, digital image synthesis and so on. Digital effects film is a type of film that uses digital technology, computer graphics, and visual effects techniques to create and enhance the visual elements of the film. This type of film focuses on the use of computer-generated images, animation, and other digital techniques to present on screen a variety of effects that are astonishing, fictional, or otherwise impossible to achieve through traditional shooting methods.

3. Development and performance characteristics of digital effects in films

The development of digital effects has gone through several key stages (below the Table 1), from the earliest experimental stages to becoming an integral part of filmmaking today.

Table 1: The development characteristics of four stages of simulacrum

four stages	period	Representative film works	Digital effects	Performance characteristics
Experiment and foundation laying	1950s - 1970s	<Vertigo> (1958)		The first attempts to use computer-generated graphics marked the first forays into digital effects
Light effect	1980s - 1990s	<Blade Runner> (1982)		Computer-generated special effects graphics developed by Pixar were used, laying the foundation for the use of digital effects in film.
CGI	1990s - 2000s	<Jurassic Park> (1993)		The rapid development of computer-generated imagery (CGI) technology has made digital effects more practical in film production.
Real-time rendering	2000s to present	<Avatar> (2009)		The Perfcap-Performance Capture Workflow performance capture process is established. Digital effects are not limited to presenting real scenes, but are also beginning to challenge the laws of physics to create abstract and dreamlike effects.

To sum up, the digital effects of the film have experienced the course of realistic style - simulation of "natural movement", performance - pursuit of "audio-visual spectacle", virtuality - "artistic innovation", from the experimental stage to become an indispensable part of the evolution of film production, which has greatly promoted the visual effects of the film. Nowadays, the contemporary film digital effects, not only improve the movie viewing, increase the fun of watching movies, but also let the audience in a realistic virtual environment, immersed in the movie world. The vigorous development of digital effects film has led to the development of digital effects synthesis technology and digital effects post-production technology. After half a century of development, the film digital effects technology has been very mature.

4. Construction of visual spectacle

The technological innovation brought about by the movie "Avatar" has changed this situation unprecedentedly, laying a new foundation for digital effects technology in movies. The special effects cost of Avatar even accounted for about half of the total cost [6]. "Psychologically speaking, the audience likes to satisfy themselves with fictional stories and likes to be deceived by images that are made to be perfect [7]." In the "Avatar" movie, although the story of humans and aliens in the movie is not uncommon, but the audience will still be curious about the story of Pandora. "Digital technology is also an ideographic language, which is different from the one-way language of words, notes, colors, lines, etc. It is a combination of multiple artistic languages, and can create expressive visual symbols by its own rules of operation [8]."The special effects create breathtaking dreamlike scenes, such as huge blue-skinned Na 'vi people, floating mountains, floating waterfalls, lush ferns, towering figs that connect the entire world to the Internet, plants and animals that glow at night...... It's like a wonderful garden of fantasy. Spectacle special effects bring the audience a strong sense of foreignness, providing a sensory experience beyond reality.

4.1. Build a simulacra scene

Baudrillard believes that simulacra is the absence of the original, and the symbol does not need to correspond to the real symbol. We can think that simulacry special effect is no master can be copied, with fidelity and simulation [9]. It can be understood as a virtual reality outside the real world produced by symbols alone. Texts such as mythology create a kind of utopian world "that wants to convince us, by becoming childish, that adults live somewhere else" and that is a huge "perfect model of all the entourage of the imitated order.[10]" People's cognition no longer depends on the appearance of the real objective world, but comes from the deformation, exaggeration and cover up of the content by symbol producers, and they can create a simulative world without using reality as a prototype. The boundary between reality and reality here becomes very blurred, but it is more real than the reality. Digital effects are the use of digital technology, visual effects and creative techniques to create scenes, plots and effects that are not easily realized in the real world. Film provides a kind of "vicarious satisfaction" for the audience, allowing the audience to obtain a virtual sexual satisfaction in the unreal world provided by the screen, instead of the audience's emotional and spiritual needs to obtain more material satisfaction in the real world [11]. Therefore, the movie special effects themselves are also one of the important ways of simulacrum. The realistic illusion of the simulated images such as sports wonders, modeling wonders, time wonders and perspective wonders also comes completely from the virtual. In simulacrum, the "simulation" has nothing to hide [12]. In Avatar, for example, although the Na 'vi may appear exaggerated in appearance, as shown in Figure 1, the filmmakers used elaborate special effects and character modeling, as well as an emphasis on character emotion and expression to give them a sense of authenticity. Na 'vi people highlight simulacra from two aspects of visual reality and feeling reality with natural and smooth movements, vivid expressions and

delicate texture.

4.2. Shaping dream images

Recreative imagination is one of the three forms of arbitrary imagination. It is a process in which people form corresponding new images in their minds based on other people's verbal descriptions, descriptions or graphic gestures [13]. Film is a fresh way to recreate imagination, and special effect is a very prominent feature of the film in the digital age. It not only expands the narrative space, but also bears the heavy responsibility of "audio-visual enjoyment" for the audience. On the basis of film narration, the creator tries to put the reconstructed mental time and space and the state of consciousness on the screen, creating an image that exists in people's hearts and transcends dream and reality. It breaks the content and form of traditional digital effects, and tends to explore the inner experience of the spiritual world in content. In the scene layout, the fictional world is presented with digital effects. In terms of narrative structure, fantastical narrative experience is created through elements such as backtracking, dreams or time travel. In terms of subject matter, it can be science fiction, fantasy, etc., which causes the viewer to fantasize about the future, alien life, magic, etc. In form, it does not adhere to realism or non-realism. In the content, we use various means to explore the inner world, emotional experience and philosophical thinking. In the case of Avatar, for example, there is an obvious illusion reconstruction. The fictional world of the film, the planet Pandora, shows rich fantasy elements. The planet's ecosystems, vegetation, and creatures are the creator's fantasy, brought to life through special effects technology. The audience is transported into a breathtaking fictional world that inspires them to explore and fantasize. Secondly, the film "Avatar" focuses on the consciousness projection tendency of the creator, and displays the inner world of the characters, people's spiritual activities, people's thoughts and imagination, and people and the future world through special effects. Through the eyes of protagonist Jake Sully, the film shows his exploration and understanding of Pandora and Na 'vi culture. Emotion is the result of the joint action of cognitive process, physiological state and environmental factors, among which cognitive factors play a key role in the generation of emotion [14]. Viewers can see Jack's inner world through his eyes, his emotional connection to the Na 'vi, and his thoughts on the planet Pandora. This approach allows the audience to project their own emotions and perceptions, creating an emotional connection with Jack. The film highlights humanity's struggle for the exploitation and resources of the planet Pandora, involving human ambition, moral and spiritual struggles. This part of the content reflects the spiritual activities of human beings, in which the audience can find reflections on human civilization and the environment, so as to carry out mental mapping. The film deals with humanity's relationship with the planet Pandora, which can be seen as a meditation on the future world and sustainability. The audience can project this relationship onto real-world environmental issues and a sense of responsibility to future generations.

Avatar presents a fictional world through the reconstruction of fantasy and the consciousness projection of the creator, and deeply discusses the inner world of human beings, spiritual activities and thinking about the future world. Viewers can establish an emotional connection with the characters in the film while projecting their own emotions and imagination, making the film a thought-provoking and immersive viewing experience. This cinematic treatment demonstrates the power of cinematic special effects to have an impact not only visually, but also emotionally and mentally.

4.3. Reconstructing heterogeneous space-time

One of the essence of digital effects is to push the unconventional frame of mind, which gives film and digital art medium forms more creativity and expressiveness. Through digital technology, film

can break through the limitations of traditional thinking and try new and even considered impossible effects and ways of presentation. This not only provides a broader creative space for film creators, but also enables audiences to experience unprecedented film art, thus bringing new perspectives and possibilities for film space modeling and visual effects. The rhythm of time and space in movies often mimics the relationship between time and space that exists in nature. The construction of the relationship between time and space is crucial in film because it affects the rhythm of the narrative, the emotional transmission, and the audience's sense of engagement.

"Digital synthesis technology continues to mature, integrating real and assumed spatial modeling, transforming film narrative into" space+narrative "[15]. Spatiotemporal heterogeneity breaks the spatiotemporal structure in reality and rearranges the relationship between time and space in reality to create a unique view of time and space, which brings innovation and artistry to the film. As in the movie Avatar, Pandora is a fictional world in a different time and space, completely different from the natural world on Earth. The planet has diverse ecosystems, organisms, geographical features and cultures, including a large number of exotic creatures and vegetation. The audience is guided into this heterogeneous space and time, feeling a different dimension of time and space from Earth, which makes the film full of fantasy and exploration elements. Jake Sully, the protagonist of the film, becomes a Na 'vi by reconstructing his mind and consciousness into a Na 'vi looking organism through digital effects technology. This process shows the reconstruction of the real world, the re-creation of time and space through the technology of digital effects. The audience can experience this process of reconstruction with the protagonist.

4.4. Steampunk aesthetic design

Steampunk means "a genre of science fiction and fantasy characterized by progressive technology based on the energy of the steam engine, which was invented in the 19th century, and other scientific techniques.[16]" The steampunk style often combines elements of late 19th and early 20th century steam-era industrialization with retro technology, fantasy, and futuristic elements. With strong postmodernist aesthetic features-collage and juxtaposition. It replicates, collages and blends the elements of distinct historical styles together, and has a mixed aesthetic feeling after grafting. Steampunk films often feature retro, mechanized architecture and technical equipment, such as steam flying machines, time machines, giant gears, bolts, pipes, and mechanical elements implanted into the limbs of characters. In the movie Avatar, the AMP device (As shown in Figure 1) is a giant robotic exoskeleton used by human characters to walk and explore. The installation was designed to take on a steampunk-inspired mechanical look, echoing the industrial machinery of the steam era. The use of steampunk style (As shown in Figure 2) in science fiction films enriches the aesthetic and emotional elements of the film, creating a creative and unique cinematic experience. This style emphasizes retro, mechanical and cultural elements, combined with science fiction elements, to provide the viewer with an engaging worldview and visual spectacle.

Figure 1: AMP device

Figure 2: Steampunk style

5. Conclusion

As a new art form, digital effects have created infinite creative possibilities for movies. It gets rid of the limitations of restoring nature and gives creators the ability to create fictional worlds and fantastic scenes. Through the use of elements such as simulacry, fantasy shaping, mind mapping, heterogeneous time and space and reconstruction, steampunk and mechanics, films can present compelling visual effects, deepen plot and characters, and thus provide audiences with an immersive cinematic experience that fulfills the audience's need for visual and emotional spectacle, creating opportunities for diversity and creativity for filmmakers.

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