

Exploring the New Aesthetic Significance of Chinese Film Art under the Influence of Digital Technology

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Abstract: Film, rooted in technology, possesses unique aesthetic characteristics that are intertwined with technological advancements. Since the beginning of the new century, the integration of digital technology has facilitated a seamless transition of film art from production to distribution, ushering in a new era of digital film aesthetics. This paper focuses on investigating the relationship between digital technology and film art, clarifying the developmental origins of both, and using the degree of digital technology's integration into film art as a starting point. By examining classic digital film texts, the paper explores the reshaping of various aspects of film production through the application of digital technology. Based on film aesthetic theories, this paper aims to deconstruct traditional film aesthetics through the lens of digital film, making meaningful attempts to establish the aesthetic framework for Chinese digital film art.

Keywords: digital technology, film art, aesthetic significance, film industrialization

1. Introduction

As the first commercially released digital film in the history of cinema, “Star Wars: Episode IV - A New Hope” (1977) marked the official entry of digital technology into the realm of film art. Subsequently, digital technology rapidly infiltrated various stages of film production, signifying the film industry's transition into the digital era. Digital technology has expanded the possibilities of film imagery, giving rise to novel creative modes and aesthetic features distinct from traditional cinema. A review of domestic and foreign discussions on digital film reveals that Chinese scholars mostly analyze classic foreign digital film texts as a means to explore film aesthetics, while neglecting the examination of the evolving relationship between “new” and “old” film aesthetics. Conversely, foreign researchers predominantly focus on the practical exploration of digital technology in film production, driven by the influence of the Hollywood blockbuster effect. Building upon existing research, this paper provides a conceptual clarification and outlines the developmental background before delving into an investigation through literature analysis, textual research, comparative study, and other methods. It discusses the manifestation of digital technology's integration into various stages of film production, such as cinematography, color grading, editing, and projection. Moreover, based on this exploration, the paper deconstructs traditional film aesthetics in the context of the digital era, thereby establishing new research directions for the aesthetic framework of Chinese digital film art.

2. Digital Technology and Film Art

2.1. Origins

Film, as an art form that combines light and shadow, has carried the human desire for transcending the constraints of time and attaining eternal life throughout the millennia of visual cultural development. The earliest manifestation of such ideas can be traced back to ancient Egyptians who, in their pursuit of preserving the body after death, embalmed it with preservative spices to create mummies, symbolizing the triumph of human physicality over mortality and the quest for immortality. French film theorist André Bazin later incorporated this notion, referred to as the “mummy complex,” into the concept of film art, stating that the invention of cinema represented “human aspirations to break free from the limitations of time and space and to acquire a means of transcending them.” [1]

Film is an art form that utilizes the principle of visual persistence, capturing external objects on film through the use of photography techniques, and projecting them onto a screen to create moving images that convey creative content. It is evident that from its inception, technology has provided a rich foundation for film production, with equipment such as printers and cameras being involved. As Robert C. Allen and Douglas Gomery mentioned in their book “Film History: Theory and Practice,” “Every technical advance carries within it certain potentials that could be realized by the sensitive film artist, but the achievements they make artistically have already been fixed by the technical parameters available to them.” [2] Throughout the evolution of film art over more than a century, the relationship between technology and film has become increasingly intertwined, forming a complex temporal-spatial entity that presents a dreamlike world of both reality and illusion.

2.2. Current Development

The ontology of film is a central issue in the study of film aesthetics. As one of the three pillars of film realism theory and the foundation of Western documentary film aesthetics, Siegfried Kracauer rooted his exploration of film’s essence in the development of photography, emphasizing that film, like photography, shares the common attribute of recording and referencing reality, thus achieving a sense of authenticity [3]. This sense of authenticity is achieved through the subject’s utilization of technology, connecting and mutually depending on each other in two distinct cultural dimensions, ultimately blending into film.

Art represents the content of beauty, while technology serves as the means of realizing beauty. Based on technology, film was born, transforming thoughts into visual existence and becoming a global perspective of technological industry and artistic form. The advent of sound film and stereophonic sound established the audiovisual techniques of film, enabling audiences to better perceive the artistic power under technological development. Color film and CGI three-dimensional special effects combined visual effects on the screen, introducing innovative perspectives for perceiving the world [4]. Since the 21st century, the integration of digital technology into film, colliding with traditional imagery, has presented film art in a completely new light, providing the film industry with a broader space for growth.

3. Digital Film Production Context and Evolution: The Integration of Digital Technology in Filmmaking

Technology serves as the genetic foundation of the art of film, and with the support of digital technology, it has given birth to digitalized film production processes and exhibition formats. These processes encompass the storage, editing, integration, and output of various content information such as images, sound, video, and text. In this section, using classic digital visual works as references, we will delve into the generation context and evolution of digital film from the perspectives of image

capture, color grading, audiovisual editing, and distribution and exhibition. This will lay the groundwork for the exploration of digital film aesthetics in subsequent discussions.

3.1. Image Capture: Reshaping Filmic Imagery, Reconstructing Realistic Scenes

The essential characteristic of digital film during the image capture stage is the replacement of film with digital cameras, specifically high-definition cameras controlled by computers. On one hand, the application of digital technology allows for improved image clarity. Furthermore, the use of high frame rate technology in specific film genres aims to present subjective effects arising from the motion in the frames, thus achieving narrative purposes. For instance, acclaimed director Ang Lee, an advocate of “high frame rate cinema,” attempted to increase the frame rate from the conventional 24 frames per second (fps) to 120 fps in his film “Billy Lynn’s Long Halftime Walk” (2016). In simple terms, movies typically viewed by audiences are filmed at 24 frames per second, meaning that 24 still frames are shown sequentially every second. In contrast, 120 frames per second indicates 120 still frames per second. Compared to the original 24 frames, more content is conveyed within a single second. Under high-speed filming, motion blur is reduced, resulting in richer and more coherent details while resolving issues of image jitter and flickering caused by camera movements. Consequently, whether it’s bullets bursting during combat or a soldier exhaling, the application of high frame rate technology creates more realistic and perfect visual effects, providing audiences with an immersive viewing experience, as noted by Douglas Trumbull, the special effects director of “2001: A Space Odyssey” (1968). The breakthrough application of high frame rate technology allows audiences to perceive the alternation of frames that is difficult to distinguish with the naked eye. In addition, the iterative advancement of 4K technology contributes to a qualitative leap in the overall quality of imagery. On the other hand, digital green screen technology directly impacts the setting of scenes in film visuals. Undoubtedly, viewers can quickly establish a sense of immersion and emotional resonance when they experience authentic film scenes. However, besides capturing real scenes during production, constructing “unreal realities” is also possible through digital green screen technology, computer-generated imagery (CGI), and other techniques. This breakthrough surpasses the limitation of film being confined to the reproduction of real-life settings.

3.2. Color Grading: Strengthening Aesthetic Experience Through Digital Intermediate Technology

With the deep penetration of digital technology into the film industry, digital intermediate (DI) technology, based on digital image principles and computer assistance, has increasingly influenced the artistic expression of films through real-time, precise, and intuitive color adjustments. As one of the core technologies of DI, digital color grading enables direct adjustments and secondary creations of lighting and illumination in film frames. Additionally, visual and quantitative processing of color grading helps create aesthetic atmospheres, allowing filmmakers to pursue their artistic visions. Italian master cinematographer Vittorio Storaro once said, “Color is part of the language of cinema. We use color to express different emotions and feelings, just as we use light and shadow to symbolize the conflict between life and death.” In recent years, the film “The Song of Cotton” (云水谣) stands out in China as one of the most successful explorations of DI technology, achieving a high level of unity between color expression and the storyline. In portraying the initial romance between the characters Chen Qiushui and Wang Biyun, the color tendencies of the frames are evident. The use of muted colors, including bright yellow, aquamarine, and silver-gray within a desaturated environment, perfectly accentuates the characters’ fluctuating psychological states from half a century ago (Figure 1). On the other hand, the depiction of the relationship between Qiushui and Jindi employs soft and warm colors, conveying their enduring and continuous emotions (Figure 2).



Figure 1: Color grading before in “The Song of Cotton”.



Figure 2: Color grading after in “The Song of Cotton”.

“Digitization is a necessary means for future post-production of films, and digital color grading is an indispensable process.” Undeniably, in the realm of film art, color often serves as a symbolic code for conveying emotions. With the integration of DI technology, any color can be used to achieve the subjective expression of the filmmaker, providing technical support and assurance for the intricate details of film art.

3.3. Editing: Creating Unreal Realism Through Digital Long Takes

Adapting to the evolution of film mediums, the application of computer digital technology in film editing is an undeniable fact. In simple terms, through digital technology, “the image can undergo infinite-level processing such as blurring, softening, sharpening, spraying, diffusing, moving, squeezing, rippling, swirling, multi-coloring, filtering, dotting, mosaic, texturing, gridding, layering, embossing, and warping.” [5] This signifies a disruptive transformation of traditional editing techniques [6]-editing is no longer just a connection between shots but rather a multidimensional arrangement in which pixels representing electronic activities can be adjusted. Here, we mainly discuss the phenomenon of digital editing that is represented by the synthesis of long takes. Digital long takes are created by digitally merging two shots taken at different times and spaces, thus seamlessly stitching together a longer narrative segment. This means that the acquisition of film shots no longer solely relies on cameras capturing complete contents but rather on the synthesis achieved through digital editing techniques. For example, the film “Gravity” (2016) begins with a continuous 17-minute long take that presents the conflicts of the storyline right from the start. It is evident that the use of digital cameras and post-production virtual techniques in the context of digital technology avoids the segmentation and editing of large-scale shots. It builds a sense of realism and depth in the shots, successfully immersing the audience into a distant and unfamiliar narrative space. Compared to traditional long takes, digitally edited long takes blur the boundary between reality and unreality, presenting a form of realistic but unreal imagery, which is in clear contrast to the narrative-driven characteristics of traditional editing techniques.

3.4. Distribution and Projection: Digital Projectors for Audience Aesthetic Experience

In the current stage, digital technology policies in the film industry greatly influence important aspects such as box office revenue and viewing experience. Tracing back to its origins, digital projection technology emerged in the 1990s and was marked by the simultaneous release of digital copies and film prints using digital projection technology in George Lucas' "Star Wars: Episode I - The Phantom Menace" (1997). This had a revolutionary impact on the film industry and strongly promoted the commercial development of film art. Sony, as a leading company in digital technology research and development, introduced commercial digital projectors with 4K resolution (4096*2160, 8.85 million pixels) using SXRD chip technology in 2004, becoming a powerful promoter of 4K digital cinema [5]. Similarly, in China, relevant regulations on internationalized digital cinema technology standards were issued in 2002 to meet the growing aesthetic demands of the audience. Director Zhang Yimou's film "Coming Home" (2014) was China's first truly 4K film. The advanced technology supported the warm and down-to-earth qualities of the film, bringing Chinese contemporary cinema back to traditional aesthetic realms. This undoubtedly affirms the effectiveness of 4K technology in the film.

4. Deconstruction of Traditional Film Aesthetics by Digital Cinema

With the iterative advancements in digital technology, the influence of digital factors on filmmaking has become increasingly evident, quietly rewriting the principles of traditional film aesthetics. This paragraph aims to explore the transformation and deconstruction of traditional film aesthetics in the context of the digital age, and make an attempt to establish the concept of digital film aesthetics.

Looking back at the development of film over the past century, traditional film aesthetics consisted of the Soviet Montage school represented by Eisenstein, the realism aesthetics represented by Bazin, and the film semiotics represented by Metz [6]. However, with the rapid development of digital technology and the advent of the digital era in filmmaking, traditional film aesthetics have undergone significant changes. Based on the detailed analysis of the evolution of digital film production stages mentioned earlier, it is evident that the involvement of digital technology has deeply transformed and deconstructed the aesthetic concepts in the field of film art.

In the contemporary cultural context, traditional film aesthetics, which revolve around the traditional notion of "reflecting reality," no longer align with the "virtual reality" depicted by digital cinema. This shift can be attributed to the alteration of the relationship between "reality" and "image" in traditional film aesthetics by digital cinema. In traditional film aesthetics, the long take has always been regarded as the most authentic form of expression, possessing a "privilege of non-interference." However, in digital film art, in pursuit of the "real within the unreal," the concept of reality is preserved based on the foundation of Bazin's long take, such as connecting two segmented shots into a substantial long take section through technical means. Although the long take in the artistic form of digital cinema is not entirely based on recording reality, it indeed provides the audience with a sense of authenticity. For instance, the film "Birdman," with its two-hour-long uninterrupted take, was composed of several segmented shots seamlessly connected through technical means. At this point, authenticity has extended beyond its previous means and transformed into a concept, subverting the traditional understanding of "reality" in film aesthetics and creating the aesthetic phenomenon of "when the false becomes true, the true becomes false," while also dissolving the genuine reality of images. Another example is the film "Battle at Lake Changjin" released in 2021. As a war epic, it extensively utilizes digital technology to depict the chaotic war scenes and close-quarters combat from multiple perspectives, enhancing the sense of realism and narrative urgency. In "The Wandering Earth II" (2023), digital technology is employed to achieve data synchronization, enabling virtual shooting and simultaneous motion capture, allowing real-time previewing of the shooting location on monitors and selecting camera angles and shooting ranges as needed. The most significant

characteristic of digital cinema is its ability to create images “out of nothing” and make them appear real. Through the use of virtual reality and computer-generated imagery (CGI) techniques, achieving visually realistic special effects becomes effortless, thereby posing a dilemma to Bazin’s advocated “cinema as the convergence of reality.” The involvement of digital compositing techniques also undermines the position of montage as the “surgeon’s scalpel” in film editing, causing “montage as an artistic technique and the ontological significance of photographic realism to fall into collective silence.” [5]

Undeniably, digital technology has brought about fundamental changes in film aesthetics, ushering in a new era of simultaneous development between film art and technology. However, amidst the enjoyment of the pleasures offered by digital cinema, “we should be aware that the development of science and technology is always a double-edged sword for humanity. Digital technology has also brought about an underestimated crisis to film aesthetics, film culture, and the film industry.” [7]

5. Exploration of the New Aesthetic Significance of Chinese Digital Film Art

5.1. Focusing on Digital Effects - Emphasizing Film Content

The digital era, marked by virtual reality and computer technology, has revolutionized filmmaking, presenting greater possibilities for domestic films. In fact, the involvement of digital technology in various aspects of film production, storage, screening, and distribution is evident. In the process of “representation-image” and “infinite-limited,” the utility of digital technology is directly manifested in the visual effects of films. Additionally, with the considerable presence of Hollywood blockbuster films, the significant imbalance between commercial and artistic films in the wave of consumerism, Chinese digital cinema is not confined within the prison of technology. Instead, it utilizes “technology” as a means rather than an end, integrating with genre films to create artistic works that embody Chinese heritage.

Genre films, as an important product of the industrialization of film, are also crucial for China to firmly establish its position in the global film wave. With the support of digital technology, action films, disaster films, and science fiction films, which had previously been limited in terms of production quality, have experienced new development. For example, “Journey to the West: The Demons Strike Back” (2017), a comedy film adapted from the classic Chinese novel “Journey to the West,” portrays numerous virtual characters such as Sun Wukong, Zhu Bajie, Sha Wujing, as well as the transformed White Bone Spirit and the enchanting Spider Spirit. Director Tsui Hark uses CGI face replacement and adjusts the focus of the shots to depict subtle facial wrinkles and expressions, eliminating any sense of displacement or artificiality for the audience (Figure 3). Another example is the film “Painted Skin: The Resurrection” (2012), a Chinese-style fantasy film created by a Chinese team, based on traditional tales from the “Strange Tales from a Chinese Studio” collection. With high-quality 3D production techniques, it showcases astonishing visual effects unique to Chinese fantasy films (Figure 4).



Figure 3: “Journey to the West: The Demons Strike Back” - Sun Wukong Figure.



Figure 4: “Painted Skin: The Resurrection” - Stage photo.

As digital technology advances the categorization of films, it also gives rise to the characteristics of “super-genre films,” which involve incorporating elements from mature classical genres. One notable example is the “New Mainstream Cinema.” As a new form of mainstream cinema, it originates from China’s cultural soil and becomes an artistic genre through enriching expression and employing distinctive artistic techniques. For instance, “Operation Red Sea” (2018), adapted from a real-life evacuation mission in Yemen, combines real events with artistic elements. When capturing the scenes of the Jiaolong Assault Team carrying out their mission, the camera employs digital techniques to reduce saturation and add graininess, creating a natural and peaceful color tone that aligns with the atmosphere of the story (Figure 5). This technique emphasizes the character outlines and combat actions in the wartime environment, producing a natural and realistic atmosphere for outdoor battles.



Figure 5: “Operation Red Sea” – Jiaolong Assault Team during a mission.

It is evident that the involvement of digital technology has not led China into a state of spectacle-driven digital cinema. Instead, it has provided more possibilities for the development of Chinese digital cinema, enabling the construction of a diverse landscape.

5.2. Localization of Digital Technology Application

Digital films in China, rooted in the development of domestic cinema, often exhibit a characteristic of emphasizing special effects while neglecting character development and plot. Although “The Wandering Earth” received considerable acclaim, another film released during the same period, “Crazy Alien” (2019), received less favorable reviews. Despite both films extensively using digital technology and being set in a science fiction context, the latter focused more on constructing science fiction concepts from a sociological perspective, exploring the relationships between people and concentrating on philosophical, psychological, and sociological values. In this section, we will discuss the technical factors and issues concerning soft science fiction films in China, which primarily employ digital technology as a production tool, based on these two film types.

With the significant improvement in digital production technology, Chinese soft science fiction films have been keen on imitating the spectacle-driven Hollywood film model, emphasizing the visual spectacle of the imagery while neglecting the essential elements of characters, plot, and substance. This has led to problems where films have visually stunning special effects but suffer from flat characterizations and weak storylines. Taking “Shanghai Fortress” (2019) as an example, the film invested a significant amount of money and technology in creating technologically advanced mecha designs and crafting battle scenes. However, the character development of the protagonist, Jiang Yang (played by Lu Han), is overly flattened, with a perfect and flawless personality and exceptional abilities, lacking personal growth and change in difficult situations. In “Shanghai Fortress,” over 1,500 shots were special effects shots, accounting for five-sixths of the total shots in the film, with the digital effects production alone costing approximately 120 million yuan. However, the robot created through special effects still possesses a heavy animated texture, creating a strong sense of detachment from the real-life scenes and making it difficult for the audience to identify and resonate with the film (Figure 6). Despite barely meeting the standards of a digital science fiction film under the impetus of digital technology, it lacks meticulous science fiction logic and cannot be considered a masterpiece.

“Crazy Alien” (2019) can be regarded as a successful example of this type of film, showcasing the distinct characteristics of localized Chinese digital cinema-the hidden Chinese culture beneath digital technology. The application of digital special effects technology in “Crazy Alien” is mainly manifested in the setting of the story background involving “alien contact” and “alien arrival on Earth.” It also meticulously portrays visual effects such as aliens and alien spacecraft, requiring significant investment. Analyzing the core of the film’s story, it reflects on and explores the loss and inheritance of traditional Chinese culture in modern society through the presentation of Geng Hao, the inheritor of Monkey King performances, facing unemployment. Behind the Chinese element of Monkey King performances lies a more profound ideological orientation related to Chinese culture (Figures 7-9).



Figure 6: “Shanghai Fortress”.



Figure 7: “Crazy Alien”.



Figure 8: “Crazy Alien” - Application of digital green screen technology and computer CGI technology 1.



Figure 9: “Crazy Alien” - Application of digital green screen technology and computer CGI technology 2.

Compared to traditional Hollywood blockbusters, although “The Wandering Earth” series stands out as a film series that is hailed as “opening the door to hard science fiction in China,” there is a greater emphasis on “soft science fiction films” in China, which are nurtured by digital technology rooted in Chinese culture. It is based on the foundation of Chinese contemporary culture and takes a different aesthetic path from Hollywood films.

5.3. Industrialization and Reflection of Digital Technology in the Film Industry

Film is a contradiction between art and industry. Renowned Chinese film theorist Shao Mujun believed that “film is first and foremost an industry, and secondly an art.” Looking at its development over the past century, the film industry in China has completely followed Shao’s viewpoint. Traditionally, film industry and technology have often been seen in opposition to art and aesthetics. In the global film landscape, this manifests as the opposition between Hollywood’s film industry and

the concept of European art cinema. “In the 1980s, the mainstream film theory and creative practice in China tended to lean towards European art cinema, and held a critical stance against the dominance of Hollywood’s film industry over artists’ discourse” [9]. Although this approach did contribute to the gradual strengthening of Chinese cinema from theory to practice during a certain period, its drawbacks have also become increasingly apparent.

In the era of digital high technology, there have been significant revolutions in the audiovisual language of films, providing unprecedented support for the flourishing development of the film industry. Based on this, Professor Chen Xuguang from Peking University proposed the concept of “film industry aesthetics” in 2017, combining humanities, arts, and technological skills as an important attempt for the Chinese film theory community to deeply engage in the film industry. It is undeniable that film industry aesthetics is based on the foundation of the film industry, which cannot be separated from the construction of a series of new input-output guarantee mechanisms in the field of digital technology, such as dynamic previews, digital resource libraries, and completion guarantees. These mechanisms play a significant role in the upgrading and improvement of China’s film industry system. However, in terms of the current production level of the film industry in China, it has not yet reached the standards of “film industrialization.” The level of technological production varies, and it is only in a state of “light film industrialization.” For example, as mentioned earlier, “Wolf Warrior 2,” although a practice in heavy industrial production as a new mainstream blockbuster, does not fully meet the principles of film industry aesthetics when examined from that perspective. The standardization and institutionalization of the film industry chain during the entire filmmaking process do not entirely align with the principles of film industry aesthetics, making it difficult to balance investment, visual effects, scenes, props, and special effects makeup. On the other hand, Guo Fan’s sci-fi blockbuster “The Wandering Earth II” (2019) launched the development of China’s heavy industrial film production. Due to the special nature of the sci-fi genre, the high difficulty of film production and the high requirements for production technology determine the film’s emphasis on high-tech production. Set design, cinematography, and special effects are all carried out around dynamic previews (Figure 10). The film uses simple animation to simulate and showcase the film’s content, including actor movements, cinematography, and camera angles, to clarify the shooting content and improve shooting efficiency.



Figure 10: “The Wandering Earth II” - Space elevator.

Undoubtedly, in the face of the achievements made by Chinese cinema in the practice of technological localization, we must be vigilant against the “dead end” of film industrialization based solely on technology

6. Conclusion

The above discussion explores the technological origins, development process, aesthetic influences, and characteristic significance of digital film art. In summary, since the inception of film art, it has been intertwined with technology. With the integration of digital technology into the entire process of film production, it has impacted traditional film aesthetic paradigms and propelled the industrialization of Chinese cinema towards a new aesthetic ecology. While technology has brought significant development opportunities for art, it is essential to avoid falling into the trap of “technological determinism” and instead focus on the path of the “solely technological discourse.” This is the direction that Chinese film artists should strive for. Based on this, Chinese film artists should approach the accelerating penetration of technology into the artistic field with a correct and dialectical perspective. They should overcome the replacement or suppression of expressive rationality by instrumental rationality, emphasize the integration of technological factors with artistic traditions, uphold cultural confidence, and break free from artistic creation dilemmas. By doing so, they can navigate the integration of technology and art harmoniously, thus revitalizing the art of Chinese cinema.

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