

Research on the Influence of Digital Technology on the Creation of Film and Television Art

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Abstract:

The aesthetic study of digital film art is one of the most important cultural phenomena since the new century. The aesthetic practice of digitalizing films is a research focusing on specific digital film works and digital film productions. From the 1960s and 1970s to the present 21st century, as films continue to undergo the process of digitalization, the unique form and power of digital images have enabled the great practice of digital technology in the field of film art under new historical conditions. With the rapid fusion of technology and art, represented by photography and film form, film art, as a typical technical art, inevitably undergoes profound changes due to the impact of new technologies during its development process, affecting the form, artistic quality, artistic concepts, and film aesthetics. By examining the development of film technology and film art, it can be observed that every leap in art and every elevation of human spiritual civilization cannot be separated from the important influence of digital technology and media development. Therefore, this paper examines and analyzes the beauty of film technology and the artistry of film, exploring the supportive role of technology in the artistic process of film in the fusion of art and technology.

Keywords:

Digital Technology, Film, Art, Aesthetics

1. Introduction

Since its inception, film as an art form has been intertwined with technology and has its own unique cultural mission. However, in the current historical context, digital technology presents both opportunities and challenges to the art of cinema [1]. The interplay and fusion of these two elements break through various limitations of the art, even evolving beyond traditional artistic, technical, and spiritual constraints in the development and transformation of societal, historical, and cultural contexts. This transformation gives rise to new artistic concepts and aesthetic propositions in digital film art and aesthetics. Digital film art is an important component of contemporary art and a significant visual cultural landscape in today's digital society. As digital

technology intervenes in film art, it brings richness, diversity, and complexity to the art, sparking intense conflicts and collisions between digital film aesthetic activities and traditional artistic activities [2]. The question arises of how digital technology can strengthen the integration and interaction between technology and art in the construction and dissemination of film art, promoting digital art practices and aesthetic practices, and creating new aesthetic value concepts for the new era, fulfilling an important mission bestowed by the digital era on civilization development. Aesthetics research in digital film art examines the historical and contemporary relationship between digital film art and aesthetic cultural development from a conceptual and theoretical perspective. Just as digital film does not emerge out of thin air, it is deeply rooted in its era, drawing nourishment from traditional art and contemporary art, especially from modern art, and benefiting from scientific and technological progress. This article mainly examines and analyzes the beauty of film technology and the artistry of film from a historical development perspective, discovering the supportive role technology plays in the art of film through the fusion of art and technology.

2. Digital Technology Enters the Art of Cinema

The intervention of digital technology in films differs slightly from the traditional technical interventions in films. In relatively open art films today, the involvement of pre-digital era technology in films is a combination of replacement and overlay. This means that different technologies intervene in film art at different times, providing a richer range of expression for films. Unlike in traditional films, the intervention of digital era films does not create a significant difference in technology because their core technology is digital. It is the precision of the technology itself and the degree and level of involvement in films that gradually makes digital films more suitable for the current society and continuously flourishing [3].

From silent to sound, black and white to color, film has undergone two major revolutions, with the leap from celluloid to digital marking the third revolution. Therefore, studying the technical factors for the survival and development of digital films should start from films without celluloid. However, fully celluloid-free films did not happen overnight. The overall technology of digital films can be roughly divided into four stages: The first stage involves converting images into video signals through post-production editing effects and creating a digital film master. The second stage includes compressing, encrypting, and packaging the master signals digitally, or recording them on DVD-ROMs or tapes, then transmitting them to local cinemas via satellite or networks. The third stage involves receiving and storing data signals at user terminals, obtaining and sending projection authorizations, and decryption passwords. The fourth stage involves projecting digital signals through digital projection equipment. In other words, the intervention of digital technology in films follows a gradual process, starting from initial involvement only in post-production editing, to the involvement in the entire process of pre-production shooting, post-production editing, transmission, and reception of films. Digital films have become a trend in film development and are unstoppable [4].

In fact, the most significant difference between digital and traditional films lies in the absence of celluloid. Once upon a time, celluloid was synonymous with film, and in people's minds, film art was celluloid art. However, this notion was completely overturned with the release of "Star Wars: Episode II - Attack of the Clones." This film was entirely shot in digital format without using celluloid, making it the world's

first celluloid-free film featuring real actors. Since then, the use of digital technology in films has been increasingly extensive, with works becoming richer. Film is no longer considered an art of celluloid but is now transitioning towards all-digital films becoming the direction of film development. The advantage of replacing celluloid with digital technology lies in meeting directors' limitless imagination, enhancing artistic creativity and expression, and creating scenes without constraints, directly leading to another trend - virtual actors and virtual scenes. The emergence of virtual actors and scenes may lead to the displacement of real actors. Even the seemingly idyllic settings seen in some films are the result of post-production work, like the lifelike Simba in "The Lion King," the realistic primal rainforest in "Jurassic Park," and the vivid dragons, among others. This advancement has brought forth a new stage where films no longer require real actors or objects; digital technology alone can create actors and scenes, establishing a new aesthetic value. Building on this, the internet's reach and the maturity of digital technology have enabled people to appreciate films not limited by physical spaces, as digital film distribution can be simplified to "upload-download-play," similar to TV broadcasts [5]. Therefore, with the right infrastructure, films can be enjoyed by the masses in the comfort of their homes, making film accessible to all. Moreover, with the advent of "digital doorstep" technology, audiences can access a variety of video content on the internet, including web films, and even experience 360-degree immersive VR films. In this sense, digital films have been fully equipped with digital technology, immersing themselves in a limitless "cyber world."

In conclusion, the involvement of digital technology in films initially served a utilitarian purpose to facilitate special effects production. However, over time, digitally produced images have become the main content of films, even influencing the development of the plot itself, becoming an indispensable and irreplaceable part of the creative process, to the point where the concept of "No digital, no film" emerged. It is evident that digital technology is gradually shifting from being a subordinate to being a dominant force in cinematic art, challenging traditional filmmaking practices and visual concepts with an unstoppable momentum. Perhaps, these developments were not envisioned by the inventors and users of digital technology in the beginning.

3. The Influence of Digital Technology on Film Art

The emergence and intervention of digital technology have greatly enhanced the art of film, becoming a driving force behind the essence, creation, and reception of films. It can be said that it is due to the strong support of digital technology that the art of film has gained a broader space for growth, releasing the technological brilliance of digital film works and allowing people to experience the aesthetic dimension of film art under digital technology. The reason why the author chooses to discuss the impact of digital technology on the art of film from the aspects of text, creation, and reception in this section is twofold: on one hand, to see if it can deepen the artistic work itself and enhance its ability to typify real life, as well as reflect its practical value in the use of film art; on the other hand, the relationship between them is closely intertwined and inseparable, and their connection becomes even tighter under the infiltration of digital technology.

3.1. The impact of digital technology on film art text

The advancement and application of technology have gradually raised the standards of the film art's requirements for itself, with "medium" serving as the carrier of the

film text and bearing an important mission. In the realm of digital technology, the transition from film to electronic storage media, from analog to digital, is one of the most fundamental and crucial parts.

Unlike traditional film text on celluloid, digital film text generally exists in a virtual state on a hard drive. When comparing the two as different mediums for carrying films, people often used to believe that “celluloid film has higher resolution than digital film.” This belief stemmed from the natural beauty perspective and the idea that film is a “reproduction of material reality,” making traditional film images presented through celluloid seem truly authentic. Celluloid film historically has a high sensitivity to color, whereas digital technology often relies on artificial color simulation to achieve color variety, resulting in lower color fidelity. In terms of light sensitivity, celluloid film can display subtle color contrasts, while digital film tends to be relatively darker in dark scenes. However, these are advantages of celluloid, not necessarily indicating that the beauty of celluloid film surpasses that of digital film [6]. The focus is on articulating the differences, advantages, and characteristics of each medium to better explore the beauty of films in different mediums.

Moreover, the advantages of digital medium should be considered. While celluloid has strong image recording capabilities and high resolution, it's essential to note that after undergoing a series of duplication processes like “original negative-reversal internegative-release print,” the final product presented to the audience is a copy with reduced resolution. Conversely, films shot with digital cameras or created digitally do not lose resolution during the process. Therefore, the resolution quality of films viewed can vary between celluloid and digital, depending on specific circumstances. With the rapid development of digital technology, surpassing celluloid film in image fidelity, color reproduction, and resolution, the era when digital films lagged behind celluloid in these aspects has passed. This study focuses on digital films, which are characterized by their strong contemporary and technical attributes. The discussion centers on the beauty brought to film art by digital technology, rather than the traditional visual artistry of celluloid films. From a technical perspective, digital filming equipment is more precise and efficient, creating vivid, full-color images composed of pixels, resulting in clearer, lossless digital texts with significantly higher quality than celluloid texts. From an aesthetic viewpoint, digital images appear more “real.” The bit-based nature of digital texts allows for convenient and rapid transmission, free from time and space constraints, making them cost-effective and versatile across various platforms like theaters and online networks. It is the continuous improvement in technological capabilities that has allowed digital film texts to showcase unique characteristics and endless possibilities.

3.2. Influence of digital technology on film art creation

Currently, digital technology has become an important tool for film creation. From the perspective of film creation, the intervention of digital technology impacts both the imagination of artistic creators and the creation methods of film art, which in turn affects the visual images presented through digital creation methods. This includes aspects such as creative conceptualization, creation methods, and creative presentation.

(1) The Impact of Digital Technology on the Creative Conceptualization of Film Art

In terms of artistic conceptualization, this is reflected in the expansion of imagination and creative space. Artistic conceptualization is a unique human thinking

ability and the starting point of artistic works, or rather the essential creative ability of artists. However, presenting the artistic concepts in the artist's mind requires technical support. Just as mentioned earlier, in the early days of film, technical constraints led to silent films which could only rely on subtitles to convey meaning. As a result, regardless of how perfectly artists imagine the actors' tones, intonations, rhythms, and volume levels in their artistic concepts, the audience cannot accurately perceive them through hearing and can only speculate about the actors' emotions and plot developments through subtitles. Black and white films also fall short of conveying works that match the creator's intentions as effectively as color films, limiting the imagination to a certain extent. In traditional film art creation, despite artists comprehensively using existing technologies to the fullest extent in expressing their thoughts and ideas, there still exists a gap when compared to the expressive power of digital technology. Or in a certain sense, it affects the artistic expression of film works and the audience's aesthetic perception [7]. Until the emergence of digital technology, it can be said that hardly any film creator could remain indifferent towards digital technology because it gives artists and practitioners more initiative and convenience, greatly enhancing the operability of the artistic images conceived in their minds. However, at the same time, this is closely related to the level of proficiency and understanding that artists have in using digital technology. This is because the creative thinking of creators stems from both life experiences and continuous learning, constantly updating knowledge. In other words, creators not only need to enrich their imagination through life experiences but also need to learn, understand, and apply technology in practice to form innovative and technologically suitable artistic ideas and works. It's true that "with digital technology, there are no unseen spaces in film and television art, only undiscovered ones."

(2) The Impact of Digital Technology on the Creative Means of Film Art

As a form of art fully integrated with digital technology, the production process of digital cinema follows operational procedures and theoretical foundations completely different from the traditional film era. In general, the production process of traditional films involves steps such as "pre-shooting, story writing, scriptwriting, location scouting, casting, camera manipulation, film shooting, developing and printing film, editing, making copies, distribution, screening, and finally being appreciated by the audience on the screen." On the other hand, the creation of digital films is entirely digitized in the pre-production, production, and post-production stages, introducing a whole new creative means for film art.

When considering the fundamental unit of film art, "image," it is evident that traditional film imagery is captured gradually through camera operation, resulting in a relatively fixed relationship between the camera, the subject, and the image displayed. Conversely, digital film's digital image creation revolutionizes these traditional relationships and characteristics. The creation of digital images often does not require direct shooting of real objects, sometimes not even a camera. Instead, it can be solely accomplished using a computer, with the generation process and sequence being non-linear. For instance, the "Toy Story" series introduced by Disney broke away from the traditional film's creative means of "reproducing material reality," starting from "Toy Story 1," with no real objects or traditional hand-drawn work needed for the entire creation, all produced using computers. This significant digital movie marks a new stage in digital cinema, becoming the first truly "fully digital production" 3D computer-animated film in film history.

Digitization in film production does not eliminate the need for cameras entirely; it merely reflects the impact of high technology on one aspect of production. From the initial storyboarding to the distribution phase, the influence of digital technology is comprehensive. Overall, this new creative means of digital technology not only enables the creation of shots that are difficult or impossible to achieve in reality but also invents visual imagery that does not exist fundamentally. Furthermore, from a temporal perspective, digital technology has exerted significant and multifaceted driving force on film art.

(3) The impact of digital technology on the creation of film visual images

Building upon the research on the influence of digital technology on the artistic means of film creation, what directly and closely relates is the visual images of the film. It is important to note that the visual images here are not equivalent to the narrative textual images discussed earlier, as visual images tend to focus on the perspective of creation, while narrative text tends to focus on the internal perspective of the entire text. For the visual images of film art, the intervention of digital technology has created more visual wonders, making film art increasingly unparalleled. Moreover, based on digital technology, many visual creations have completely transitioned from cameras to computers due to innovative production methods. Looking at the development process of digital technology's intervention in film visuals, there have actually been instances of digital technology used in the traditional film art field, such as hardware conditions for film production and some partial use of digital technology in production processing. However, at that time, the degree and form of technological intervention did not fundamentally impact the visual images of film, nor did it bring about revolutionary or profound changes or advancements in the artistic expression and creative practices of film. It wasn't until the film "2001: A Space Odyssey" in 1968 that a very slow scene of a spaceship and space station docking appeared, where the control panels on the flight deck were completed using computer animation, marking the earliest known application of CGI technology in films within an acknowledged range. With "2001: A Space Odyssey" as a milestone, digital technology officially began its collaboration with film.

4. Conclusions

The aesthetic concept of digital film art is a conceptual study that takes digital film art as the main body and starting point, and the transformation of aesthetic concepts as the research method. It mainly reflects in the examination perspective of digital aesthetic of film art and the aesthetic evaluation and advocacy of digital film art activities by aesthetic theories. The integration of digital elements into artistic activities is the result of the autonomous choice of film art in the digital media technology environment, and it also provides film art with new space for development. The interactive development of digital media technology and film art, the creative integration of digital film art and aesthetic theories in aesthetic value concepts, is of great significance for artistic practice and aesthetic cultural construction in the digital age. The profound impact of digital technology and media on artistic aesthetic concepts is not only an artistic phenomenon, nor merely an aesthetic phenomenon. We can analyze it not only from an artistic perspective but also from an aesthetic perspective, but ultimately, this research will inevitably lead to a more profound humanistic spirit and a more macroscopic aesthetic cultural path.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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