Digital Innovation and its Impact on the Aesthetic Experience of Films: An Analysis of the Role of Technology in Visual Communication

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Abstract: Digital technology is the main means of visual communication at the present stage, which is the innovation of digital technology in the early 21st century into various fields of film creation to open up the digital film era. With the intervention of digital technology, digital film aesthetics presents the characteristics of complexity, pluralism and modernity. The innovation of digital technology affects all aspects of film development and provides a new Angle for the creation of film aesthetics in the new era. At the same time, the demand and expectation of the film audience have also changed, from the traditional rational perception to the perceptual entertainment, and put forward new requirements for the visual communication mode of the film, which also shows that the traditional expression method of the film art is no longer enough to support the transformation of the modern consumer market. How to give full play to the advantages of digital technology in film visual communication and help film art to construct a new aesthetic paradigm has become a new concept of digital practice in film creation. In order to analyze the impact of digital innovation on film aesthetic experience, a series of new manifestations of digital innovation in film visual communication are summarized through literature analysis and data analysis, and new concepts about the evolution tendency of film visual communication under digital technology innovation are put forward, based on which the impact of digital technology innovation on film aesthetic experience is judged.
Keywords: Digital Innovation; Technological Innovation; Film Aesthetics; Visual Communication

1. INTRODUCTION

The new technology represented by digital innovation affects various fields such as industry, humanities and art, and is also deeply integrated with China's film industry. It has also derived new techniques and new aesthetic connotation of film creation. It can be said that the innovation of digital technology not only subverts the traditional media of film communication, but also endows the visual communication of film with more profound aesthetic heritage, and provides the possibility for the derivation of new ideas of film creation. At present, digital aesthetics and digital film have aroused extensive discussion in the academic circle. With

the communication advantages of digital technology, digital film has become a new path for the innovative development of visual communication. Analyzing and verifying the impact of digital innovation on film aesthetic experience is of great significance for constructing a complete digital film research achievement system and promoting the innovation of film visual communication mechanism (BORYSOVA et al., 2024).

2 THE EXPRESSION OF DIGITAL INNOVATION IN FILM VISUAL COMMUNICATION

2.1 Symbiosis between Content and Form

Art creation has a certain aesthetic and creative, from the perspective of traditional art creation, technology and art have no intersection. However, under the background of digital innovation in the new era, film visual communication art and digital technology complement and innovate each other, providing conditions for the symbiosis of content and form. Digital innovation has promoted the expansion of film visual communication content. The foundation of artistic creation is imagination, and it is the responsibility of digital technology to present the imagined content in a more realistic and charming image (Zhang, 2023). For example, Director Ang Lee's Crouching Tiger, Hidden Dragon used Dolby sound to expand the projection mode to 3D and expand the content of the film to a more three-dimensional space. Or Crouching Tiger, Hidden Dragon uses Wiya technology to create a real sense of martial arts, and then eliminates the real Wiya traces through digital erasure technology, which has also become the mainstream direction of visual communication innovation. This formal processing provides a more real and broad space for content presentation (Darley, 2002).

2.1 The Stitching of Virtuality and Reality

The application of digital innovation in film creation has changed the operation mode of traditional visual communication and derived a new visual perception law, which also corresponds to the connection between virtual and real space. In the new digital space, the narrative space is no longer limited to a framed real world, but any virtual space to be set. On the one hand, in the digital era, film creation is computer-assisted, and computer image synthesis technology surpasses the transmission effect of traditional film films and can generate a world only presented in specific

scenes. The application of this digital imaging technology cancels the 1:1 copy of the real society in traditional film creation, and gradually eliminates the boundary between the virtual world and the real space. New media theorist Lev Manovich calls this virtual reality imagery "synthetic realism." On the other hand, digital technology can achieve a perfect fusion between the character and the background. In the digital space, each element in the film picture is in its own independent plate, according to the background setting and character setting, to achieve the deep integration between various elements and the film background, such digital integration hides the part that is too perfect in the virtual world (Cai & Su, 2022). That is, by changing the tone and texture, eliminating the traces of manual processing, so that the final picture effect presents the authenticity aesthetic. In the movie "Assassination of the Novelist", the protagonist enters the virtual space of the novel with the help of digital technology. The movie poster is shown in Figure 1. This digital space is similar to video games, where characters are given their own body symbols and action symbols. This technology opens up the gap between the real space and the virtual image, and the confusion between the virtual space and the reality also subtly "stitches" the physical space and the virtual space.

Figure 1: Poster of the Assassination of the Novelist

2.3 Interaction between Subject and Object

Digital innovation provides interactive space for the subject and object of visual communication. As a new communication medium, digital technology provides a more unique and interactive visual communication

experience for the film creation subject and consumer object. The traditional way of visual communication is mainly based on the three means of picture, text and sound to achieve the requirements of attracting consumers. In the traditional film creation activities, the main body of visual communication, namely film creators and producers, is the key factor. In the era of digital innovation, the object of visual communication gradually occupies the main position (McClean, 2007).

The viewing mode and viewing experience of consumers have undergone an essential change, which also means that film creators must use digital technology to achieve the leap of visual communication space, interact with consumers anytime and anywhere, and enable consumers to participate in film art production and experience the happiness brought by digital mode (Zhu, 2023). Nike ID is a product based on the network platform and consumer interaction, consumers can not only use the network platform to order Nike products, but also can design shoes and clothing on the online platform. For example, choose from a variety of color combinations and graphics that interest you. This consumption platform, cleverly using the interactive advantages of network media, to meet the special needs of different consumer groups, to achieve the positive interaction between the consumer object and the Nike creation subject, so that consumers personally participate in the creation of artistic fun (Yu et al., 2022).

3. AESTHETIC EVOLUTION: THE EVOLUTION TENDENCY OF FILM VISUAL COMMUNICATION UNDER THE INNOVATION OF DIGITAL TECHNOLOGY

3.1 Simulation

The most prominent change in digital innovation conveyed by film is the formation of virtual simulation images. On the one hand, digital technology can help the creative staff to transform the imagined content into digital images, and in the process of shooting, the main creator can also arbitrarily process the digital scene according to the creative needs. The digital image can also adjust the color, space and texture according to the setting requirements, and pursue a more real and vivid visual space (Stoliarchuk et al., 2024). For example, the digital re-creation of the human body. One is to maximize the match between virtual and reality and improve the simulation level by combining real performance with digital collection. The Hulk and Iron Man in The Avengers are both virtual simulation bodies

formed by combining the actor's body with the digital body. The other is to create a completely virtual digital image, building the human body from digital drawings alone. The digital tiger in Life of PI and the shape-shifting machine in Transformers (2007) are independent digital virtual bodies. The simulation aesthetic content of the film is shown in Table 1.

Table 1: Simulation Aesthetics of Movies

Realistic Perspective	**Realistic Space**	**Subjective Reality**	**Virtual Reality**
True Angle	Objective Existence	Subjective Imagination	Unknown Reality
Aesthetic Status	Creation Background	Spatial Coordination	Spatial Alienation
Digital Technology	Motion Capture Technology, 3D Technology, CGI Technical Etc		VR Technology

3.2 Compounding

Digital innovation provides a new creative possibility for the film aesthetic space. Digital editing technology, shot creation technology and virtual simulation technology all inject vitality into the development of film aesthetics. On the one hand, digital technology has subverted the traditional movie space, and the alternative transformation of the movie space by 3D and VR technology has continuously enriched the visual experience of the audience (Hu & Ye, 2023). Both the simulation of the historical space and the imagination of the future space realize the complex reconstruction of the traditional film virtual space. The simulation of Paris at the beginning of the 20th century in Hugo and the planet Pandora in Avatar show the complexity of digital modeling (Cui, 2023). On the other hand, the innovation and progress of digital technology provide a new composite processing function for the development of film aesthetics. Digital technology allows countless layers of coatings to be controlled and superimposed to form entirely new movie Spaces. Digital technology can collage virtual images, virtual characters and real scenes to help generate a complete story plot, and give full play to the artistic function of film editing means. Inception realizes the folding of fragmented dream and reality space; "Eyes Like a Puzzle" combines the excitement of watching a sports competition with the tension of a fugitive being captured for a digital audience. With the aid of digital technology, film aesthetics is no longer just a simple shot splicing, but the integration of virtual materials after

screening and refining.

3.3 Spectacle

With the assistance of digital technology, the film aesthetic space transcends the traditional narrative rhythm narrative space and narrative style, showing a tendency of spectacle as a whole (Wen, 2022). On the one hand, the fragmented splicing supported by digital technology provides a new idea for the traditional linear narrative of film. The narrative space in the film presents a more complex and jumping structure, which is devoted to exploring the influence of narrative itself on the content of the film. Digital technology, on the other hand, excels at deconstructing and reconstructing the plot. The content of a story is fragmented and decomposed, and combined into a more concentrated moment or plot clue, with the help of complex narrative perspectives to provide guidance to the audience. The movie Memento presents a complex narrative organization through flashback memory + sequential reality. The fragmented memory of the hero constantly flashes also fully presents the rational cognition of human beings on their own predicament based on existing thinking, and thus attracts more audience's attention to the puzzle of the film (Manovich, 2001).

4. THE IMPACT OF DIGITAL INNOVATION ON THE AESTHETIC EXPERIENCE OF FILM

4.1 Innovation in Simulacrum Technology: the "Surrealism" of Virtual Images

The film art creation under the digital innovation has further enhanced the authenticity and credibility of the virtual picture, and the innovation of simulacra technology has provided a higher degree of freedom for the film art creation.First, a technology with more powerful and mature color adjustment functions has changed the traditional light distribution technology in film creation.

The colorist can make local adjustments to a certain detail picture to improve the expressiveness and fidelity of the overall film picture, and it is precisely because of the color adjustment of the picture that the visual effect of the film picture is more real and prominent. Compared with the traditional movie picture, the digital picture has a higher bit depth, for example, a 32-bit image can almost contain most of the light and color, so its accuracy and complexity are also higher (Fan, 2021). The density levels

of film digital images are shown in Table 2.

Table 2: Comparison of Density Levels of Film Digital Images

Bit Depth/Bit	Number of Classes/Levels	Picture Brightness
8	2~8	255
10	2~10	1023
12	2~12	4096
16	2~16	65537
32	2~32	43 Hundred million

Firstly, the innovation of simulacrum form. With the support of digital technology, film creators no longer need to construct digital drawings by replicating the existence of objects, but reproduce aesthetic objects in the imaginary space through modeling technology. Generally speaking, the film imaging mode supported by digital technology mainly includes restoration, simulation and interaction. Firstly, restoration refers to the realistic reproduction of the existing objective world of human beings. The use of simulacra technology to reproduce the reality of the scene, including the past world and the present world. "Life of PI" reproduces the real historical space in the past, and also creates fierce animals that are difficult to control in reality through modeling, thus completing the construction of classic plots and movie themes. This shows that simulacra technology creates an illegible virtual world for the audience while connecting with the film narrative.

Secondly, simulation refers to the reproduction of the imagined scenes of the main creator, mainly in the form of science fiction, future and alienation, with obvious virtuality, simulation and fantasy characteristics. The main expression is the scene in the imagination of the main creator, and there is no objective connection between the real existence (Van House, 2011).

Finally, the interaction is to use VR technology and AR technology to change the realistic relationship between the subject and the object, to realize the interaction between the virtual and the real, but also to change the interaction between the subject and the object of traditional film creation. Film visual communication media from 2D to 3D to 5d, from traditional wearable devices to the naked eye form, all kinds of different interaction modes are also constantly being developed, further widening the interaction space between the film and the audience. This deep integration of technological innovation and film aesthetics not only generates a new narrative mode, but also deepens the media and artistic attributes of film visual communication.

4.2 The Progress of Simulation Technology: the Impact of Compound Narrative

Digital technology can provide more complex digital events for film creation, and seamlessly process fragmented events, which can significantly enhance the sensory impact of virtual narration.

First, digital technology has transformed the traditional film lens and formed a super-long complex narrative, thus generating the "digital lens" with the function of traditional montage. Different from traditional montage editing techniques, digital visual communication emphasizes more on arousing the audience's sensory pleasure, and this form of digital montage is mainly generated through the superposition of multiple layers of data. Specifically, digital superposition requires that each subject is in the corresponding layer, and each aesthetic object is independent from each other, but it appears in the form of a whole, thus building a complex spatial element. Creators can also use digital algorithms to transform the position, color, perspective and other digital attributes of each aesthetic object, so as to adjust the visual image of aesthetic objects (Le Grice, 2002).

Second, the space in the digital lens is variable and can be compounded at any time. This kind of reprocessed spatial object is essentially a simulacra that does not exist in real life, and is completely an artistic creation completed by the combination of imagination and technology, which provides endless potential for changes in digital layers and aesthetic objects.

Third, the editing marks in digital shots are lighter (Li, 2021). The time and space in the virtual shot no longer need complex editing to form a continuous or omitted shot group, but through direct deletion or addition of elements in the space to achieve scene transformation. The digital events of virtual simulation can reflect the changes of the scene by changing the elements in the space. This spatial transformation is no longer limited by objective factors, and can provide the audience with more complex and real viewpoints. For example, the process of virtual blood flow and the internal operation of electrical appliances can be realized through virtual simulation.

Fourth, the composite aesthetics of digital space no longer focuses on the editing and combination of real space, but creates digital space and digital practice by combining all kinds of real materials. On the one hand, long shots are no longer controlled by objective factors, but through the reorganization and transformation of virtual elements. On the other hand, in the digital space, different Spaces can also be combined into a

single aesthetic space, and the completely different elements in the objective existence can be combined and transformed to enhance the visual impact (Sun, 2022).

4.3 The Development of Special Effects Technology: the Veracity of Image Synthesis

Before special effects technology officially entered the field of film creation, how to synthesize different images has always been the bottleneck of film editing. With the technological innovation, the traditional editing and synthesis technology is gradually replaced by the new image processing technology, which is supported by the computer graphics principle and graphics processing method. First, the existing image material is converted into a digital file. Secondly, the data is edited and synthesized into an independent image (Chen, 2021). Finally, convert the file format to output. In short, it is the integration of fragmented image material to form a new image. These fragmented materials are not only integrated into one body, but can also be attached to each other, deformed and fused. Skilled film editors are also free to modify images according to creative requirements and film themes. Special effects technology is generally used for blue-green screen synthesis, human body reproduction, removal of traces, picture restoration. Such as CG (Computer Graphics) technology, is the use of digital algorithms to convert two-dimensional graphics or three-dimensional objects into digital processing technology, mainly using computer language to change graphics. On the one hand, the application of CG technology in film visual communication has boosted the development of virtual image expression. In order to pursue the truth, the hero of the movie Inception built a sixth floor space, as shown in Figure 2. This space is almost entirely produced by CG technology, and the author uses CG technology to reproduce the architectural styles of various eras, while fully presenting the mystery of the sixth floor space, attracting the audience to enter it. On the other hand, CG technology can further enhance the authenticity of film visual communication. For example, the psychological interpretation of the movie characters, the reproduction of subtle vibrations, and the details of the characters' avoidance of danger. "The Jungle Book" is through the virtual photography technology to obtain lens distortion and lens halo and other visual features, for the audience to create a real forest scene, with the characters in the fantasy forest shuttle.

Figure 2: Lost Space on the Sixth Floor

5. CONCLUSION

Digital innovation is involved in film visual communication, helping film creation to enter a new stage of development, giving film new aesthetic connotation, changing the aesthetic object and technical space of traditional film expression forms, especially the development of simulaculation technology, simulation technology and special effects technology, to a large extent, changing the visual form of film, providing the audience with a more perfect sensory experience. The higher the level of digital technology, the stronger the authenticity of the virtual scene of the film, and the visual communication form of the film is also richer. In film visual communication design, science and technology, as a new means of communication, provides a new creative idea and technology for film visual communication. This also requires film creators to take the initiative to understand more advanced and advanced visual communication technology and creative ideas, and transform digital technology into creativity and productivity, so as to achieve the most perfect visual communication effect.

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