Postprint of the Application of Modern Film Production Techniques in Documentary Creation

Authors: Sun Wenjia

Date: 2023-10-08T00:00:00+00:00

Abstract

Film is a technologized art form, and each technological revolution transforms its formal characteristics. From silent to sound films, from small to wide screens, and to today' s digitalization, advances in technological means have repeatedly revolutionized filmmaking methods. Modern film production technology is an imaging technology based on post-production digital processing of images, where the final screen image is virtually synthesized from different images, encompassing common practices such as high-definition cinematography, digital visual effects, and 3D modeling. This paper examines the content of modern production technologies and explores their specific applications in documentary film creation.

Full Text

Preamble

Title: The Application of Modern Film Production Technology in Documentary Creation

Abstract: Cinema is a technological art form, and each technological revolution has transformed its nature. From silent to sound films, from small to wide screens, and now to digital formats, advances in technology have repeatedly revolutionized filmmaking methods. Modern film production technology represents an imaging technology based on post-production digital processing, where the final screen image is virtually synthesized from different sources—commonly seen today in high-definition filming, digital special effects, and 3D modeling. This paper examines the specific applications of these modern production techniques in documentary creation.

Keywords: modern film production technology; documentary creation; application
Classification Code: J952

Document Code: A
Article ID: 1671-0134(2019)09-059-04
DOI: 10.19483/j.cnki.11-4653/n.2019.09.015
Author: Sun Wenjia

Documentary films serve to embody national will and image, characterized by strong ideological content. They typically combine archival materials with oral history approaches. As film production technology advances rapidly, public demands for televisual aesthetics continue to rise. Traditional documentaries no longer satisfy contemporary developmental needs or audience curiosity about historical events and figures. This paper analyzes the application of modern film production technology in documentary creation.

Documentary production primarily employs documentary techniques that objectively capture events while organically integrating historical materials to enhance visual expressiveness. Due to their inherent nature, creators must carefully consider visual language, incorporating interviews and recreations of past scenes. Interviews with subjects primarily use documentary approaches with fixed shots, focusing on the conversation content.

The development of computer digital technology has opened an entirely new artistic space we might call "digital space," where live performances and animated virtual images can be seamlessly integrated, enriching cinematic expression. Computer digital technology not only merges animation with live action but also transforms traditional 2D animation into three-dimensional forms. For instance, *Jurassic Park* (1993) extensively employed 3D technology, creating a virtual world where humans could interact with extinct species. According to reports, hundreds of computer engineers used 110 high-performance computers to build thousands of 3D models for the film, achieving not only highly realistic scenes but also endowing virtual creatures with rich expressions and textured skin.

1. The Development Trajectory of Modern Film Production Technology

In 1895, the Lumière brothers developed the cinematograph, which combined photographic and projection lenses. Due to technical limitations, early cameras could only shoot at 12 frames per second, resulting in choppy, stop-motion-like playback. Film later evolved to the standard 24 frames per second. Editing was essentially a non-linear process involving cutting, arranging, and splicing film strips. Editors would first develop a workprint from the negative footage, then use editing benches to select desired shots, physically cutting the film into individual segments before reassembling them with glue or tape according to the director' s and editor' s creative vision. Though primitive, these methods established the foundation of film editing.

Today, even films shot on celluloid can be converted to digital video signals through telecine processes for editing in modern non-linear software, with the

reverse process (digital-to-film) also possible. While film offers distinctive aesthetic qualities, its high cost and relatively primitive editing methods have led the vast majority of contemporary productions to adopt digital cinematography. Digital technology has democratized filmmaking to the point where anyone can now shoot and edit videos using smartphones.

2. Analysis of Modern Film Production Technology

Cinema is a technological art, and each technological revolution transforms its form. The progression from silent to sound films, small to wide screens, and now to digital formats has repeatedly revolutionized production methods. Modern film production technology represents imaging based on post-production digital processing, where final screen images are virtually synthesized from multiple sources—commonly seen in high-definition filming, digital special effects, and 3D modeling. As these technologies advance, particularly with digital cinema and the launch of CCTV' s documentary channel, traditional archival-based approaches no longer meet audience expectations, failing to provide sufficient immersive engagement with historical events.

Documentaries can employ cinematic production methods for diversified enhancement while maintaining substantive themes, thereby increasing historical immersion. Modern film production techniques apply throughout pre-production planning, principal photography, and post-production.

2.1 Pre-production Planning

Topic selection must reflect contemporary relevance while demonstrating historical tension, enabling audiences to understand developmental processes and grasp the relationship between history and present reality. Additionally, themes should align with current developmental concepts, integrating meaningful ideas to provide practical reference models.

Pre-production should fully utilize modern technical means to formulate scientific production plans. Traditional television production often suffered from ambiguous division of labor, affecting post-production quality and staff motivation. Modern film production features detailed functional divisions—including directing, lighting, cinematography, and coordination departments—with greater emphasis on planned task distribution. Planning involves resource integration and rational allocation to enhance film quality and maximize economic benefits.

First, computer multimedia software can transform screenplays into electronic storyboards incorporating sound, composition, and background effects—a crucial element of digital filmmaking. Second, production teams should fully grasp narrative structures, extracting compelling elements to create suspense and maximize program impact. This breaks traditional narrative patterns by introducing dramatic structures, enriching documentary content arrangement while maintaining authenticity. Finally, for effects-heavy films, visual effects supervisors create concept art for different scenes based on the screenplay and director' s

requirements. After director approval, they may proceed directly with 3D scene construction.

During production, if many scenes involve blue/green screen shooting with CG characters or assets, on-set visual effects personnel assist directors in arranging tracking markers and strategically using blue screens for occlusion. Visual effects companies also employ professional equipment for on-set lighting capture and perform 3D scanning of actors, significantly saving time and ensuring effects quality in subsequent production.

2.2 High-Definition Filming

High-definition filming utilizes in-camera digital processing to achieve image quality approaching that of film. Compared to standard definition, HD offers composition closer to human visual perception and more detailed texture processing, enhancing overall visual immediacy. Moving shots captured with auxiliary equipment—where the camera moves during filming—are called motion shots. While television documentaries traditionally rely on pan, tilt, and zoom movements, cinematic production employs tracks, cranes, and other means for comprehensive camera choreography. These techniques are increasingly applied in documentary filming, breaking the monotony of static shots, adding dynamic effects, and enhancing visual freshness.

2.3 Achieving "Situational Reenactment"

The combination of 3D virtual and live-action production holds significant importance in documentaries, primarily through situational reenactment and scene reconstruction. This approach uses 3D modeling software to achieve conceptual recreations based on live-action footage, representing subjective artistic interpretation. Widely employed in documentaries, its main advantage lies in visually presenting elements unavailable in archival materials.

In the documentary *Xi' an 2020*, which depicts the early Tang Dynasty and the pursuit of Chinese culture in Chang' an, the production used "historical reenactment" through actors performing period scenes. While this involves subjective artistic interpretation, modern cinematic production methods transform traditional documentary concepts. Contemporary documentary creation must prioritize historical authenticity while deepening audience appeal and identification.

3. Specific Applications of Modern Film Production Technology in Documentary Creation

While documentaries are grounded in authenticity, as film works they inevitably involve some creator intervention in reality. Documentary production follows diverse and parallel processes with multiple solution pathways. This paper uses technology as a fulcrum to analyze common beginner challenges, establishing

a broad discussion model that presents clear ideas as a conceptual tool for addressing documentary production issues.

3.1 Application in Humanistic and Historical Documentaries

Modern film production technology applies differently across documentary types. For humanistic and historical documentaries, techniques like situational reenactment and digital modeling are particularly relevant due to large temporal spans and scarce visual materials, requiring external means to enhance immersion. *Peking Opera* serves as a case study .

3.2 Application in Major Historical Event Documentaries

For documentaries recording major historical events, techniques like realistic performance and situational reenactment enhance visual impact. Such documentaries often feature strong narratives; relying solely on archival materials provides insufficient immersion. Reenactment techniques add vitality, while intercutting archival footage and interviews between reenactments increases audience engagement. In *Treasures of the National Palace Museum in Taipei*, "situational reenactment" was extensively applied, though limited live-action footage reduced authenticity. Such documentaries can combine "animated maps" and "situational reenactment" with interview footage to enhance reliability and authenticity .

In conclusion, documentaries can employ cinematic production methods for diversified enhancement while maintaining substantive themes, improving production efficiency and historical immersion. Digital information technology streamlines and accelerates the entire filmmaking process. Modern production techniques apply throughout pre-production theming, principal photography, and post-production. For major historical event documentaries, realistic performance and reenactment enhance visual effects and narrative vitality, while intercutting archival materials and interviews between reenactments strengthens audience immersion.

References

[1] Cai Heyang. Research on the Application of Modern Film Production Methods in Documentary Films[D]. Jiangsu Normal University, 2014.
[2] Liu Yachen. Technology Achieves Dreams: The Deep Cultivators of Modern Film Production Techniques—Digital Imaging Technicians (DIT)[J]. Digital Imaging Times, 2017(2).
[3] Chen Jie. Comparative Analysis of Traditional Film Lenses and New Media Film Lenses[J]. Media Forum, 2019, 2(8): 37, 40.
[4] Shen Yanfei. Research on Secondary Vocational Moral Education Based on Class Microfilm Production[J]. Modern Vocational Education, 2019(3): 46-47.
[5] Ma Nannan, Zhang Shuduan. Cultural Characteristics and Significance of Web Films from the Perspective of Post-Cinema[J]. Film Literature, 2018(22):

20-23.
[6] Li Jiang. Research on Digital Film and Television Special Effects Design and Animation Synthesis Methods[J]. Packaging World, 2018(4): 69.
[7] Lin Song. The Construction of National Discourse and Innovative Development of Contemporary Chinese Animation Film Art[J]. Southeast Communication, 2018(12): 54-56.
[8] Zhu Yuan, Yang Zhongxiong. The Future Development of Interactive Films Driven by Artificial Intelligence[J]. China Science and Technology Industry, 2018(9): 73-75.
[9] Chen Shuo. The Influence of VR Technology on Film Creation and Its Development Direction[J]. Film Literature, 2017(17).
[10] Kang Yanzhi. Research on Digital Film Art Production[J]. New Media Research, 2015, 1(2).
[11] Yao Ruoxi. On the Aesthetic Value and Cultural Connotation in Microfilms[J]. Drama Home, 2017(12).
[12] Wang Xiaoming, Li Na. On the Importance of Digital Intermediate in Film and Television Creation[J]. Digital Design (Part 2), 2018(9): 101-102.
[13] Zhou Yunong. Analysis of the Application of 3D Technology in Film Production[J]. Radio & TV Journal, 2017(11): 63-64.
[14] Chen Shuo. The Influence of VR Technology on Film Creation and Its Development Direction[J]. Film Literature, 2017(17): 8-10.

(Author' s Affiliation: Jilin Radio and Television Station)

Note: Figure translations are in progress. See original paper for figures.