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Characteristic Analysis of Cultural Relics Photography in the New Media Context (Postprint)

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Abstract

The rapid development of new media and advanced science and technology has provided broader forms of artistic expression and dissemination channels for cultural heritage imaging, while also presenting numerous challenges to cultural heritage photography: confronted with new media display requirements and the public's growing cultural demands, how to employ photography to capture excellent cultural heritage images that satisfy display requirements and reveal the historical, artistic, and scientific values of cultural artifacts constitutes one of the current challenges in cultural heritage photography. This article, from perspectives including new media presentation methods and characteristics of cultural heritage, categorizes types of cultural heritage images, analyzes the distinctive features of cultural heritage photography, thereby furnishing beneficial theoretical references for the photographic documentation of cultural artifacts, and enabling better recording and communication of the beauty of cultural heritage.

Full Text

Preamble

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An Analysis of the Characteristics of Cultural Heritage Photography in the Context of New Media

Abstract: The rapid development of new media and advanced science and technology has provided broader artistic expression forms and dissemination channels for cultural heritage imagery, while also presenting numerous challenges to cultural heritage photography. Faced with new media display demands and the public's growing cultural needs, one of the current dilemmas in cultural heritage photography is how to use photography to capture excellent images that meet display requirements and reveal the historical, artistic, and scientific values of

cultural relics. This article, from the perspectives of new media presentation methods and the characteristics of cultural relics, summarizes the types of cultural heritage imagery and analyzes the characteristics of cultural heritage photography, thereby providing beneficial theoretical references for photographing cultural relics and better recording and conveying their beauty.

Keywords: new media; cultural heritage photography; movable cultural relics; immovable cultural relics

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1. Background

Cultural heritage photography serves as a crucial means of documenting the current condition of cultural relics and promoting cultural heritage. The emergence of digital new media such as the internet and mobile phones, coupled with improvements in the performance of related digital hardware and software, has continuously enriched the expression methods of cultural heritage imagery and provided broader dissemination channels. In this technological tide, cultural heritage photography has assumed an increasingly pivotal role in the field of digital cultural heritage dissemination.

Current new media display methods in museum public services are remarkably diverse. Online services include websites, microblogs, WeChat, and mobile apps that enable virtual exhibitions, artifact information display, route planning, cultural product promotion, and educational outreach. Offline services encompass electronic information screens, touchscreens, digital theaters, and VR headsets in physical exhibition halls for artifact information display, route planning, and interactive games. Compared with traditional media such as newspapers, radio, and television, these new platforms demand a unity of artistry and scientific accuracy in their cultural heritage imagery, with particularly high artistic standards that must both highlight the artifacts' intrinsic features and provide aesthetic appeal. However, cultural heritage images not directly used for new media display (hereinafter referred to as "record-type cultural heritage images") serve as image data requiring further processing before new media presentation. These generally require the removal of artistic elements, such as for electronic galleries (2D) and 3D digitization display methods, where photographers must follow technical requirements without artistic creation, obtaining orthographic image sequence combinations of the artifact's entirety and details to achieve goals of minimal distortion, accurate color reproduction, and sufficient continuity, thereby providing precise images for post-processing to produce realistic 2D or 3D digital artifacts.

2. Characteristics of Cultural Heritage Photography

Cultural heritage photography belongs to the genre of still-life photography. Its primary distinction from general still-life photography lies in the unique

nature of its subjects—cultural relics themselves, which are material and spiritual remnants of human history and precious historical and cultural heritage. This uniqueness endows cultural heritage photography with two fundamental characteristics. First is its scientific nature: cultural heritage photography is a rigorous scientific documentation process that must scientifically and faithfully record the actual condition of cultural relics while ensuring their safety, possessing high documentary value. Second is its artistic nature: it must artistically and expressively present the beauty of cultural relics.

Different digital multimedia display methods require different types of cultural heritage imagery, and the methods of cultural heritage photography consequently vary. Faced with various new media display technologies, how to photograph cultural relics to meet diverse display needs and fully embody their intrinsic beauty represents a current challenge in the cultural heritage photography field, with neither relevant standards for reference nor precedents or experience to follow. This article analyzes the inherent characteristics of cultural heritage photography in combination with new media presentation methods and artifact characteristics, exploring how cultural heritage photography can targetedly record and extract the intrinsic beauty of cultural relics in the new media environment.

2.1 Scientific Nature of Cultural Heritage Photography

Photography is a modern scientific technology based on principles of optics and mechanics. In general, the primary task of cultural heritage photography is to faithfully reproduce the original object's appearance. As Luo Zhewen wrote in "Photography of Ancient Architecture," "In short, when photographing an ancient building, a detail, a decorative element, or even an architectural complex, the first requirement is to capture it clearly, correctly, and completely (where completeness refers to graded completeness). These requirements constitute what we call the scientific nature of photography." In other words, the scientific nature of cultural heritage photography refers to adhering to objective facts and clearly and completely documenting the photographed artifact while remaining faithful to its inherent characteristics, without phenomena such as blurred or incomplete textures or incorrect colors.

Although cultural heritage images serve different purposes in the face of new media technological demands, the requirement for scientific accuracy in cultural heritage photography remains consistent: to conduct reasonable, correct, and effective photography of cultural relics according to the needs of new media technologies. One cannot deliberately alter the authenticity and scientific accuracy of cultural heritage imagery for artistic purposes.

For instance, new media display methods such as electronic galleries (2D) and virtual reality (3D) require shooting a series of continuous cultural heritage image sequences as record-type images for later orthophoto stitching or 3D modeling. These sequences must ultimately produce distortion-free images with high

color fidelity or structurally and colorimetrically accurate 3D models. If, during photography, image distortion leads to incorrect texture stitching, missed shots result in discontinuous textures, or failure to perform color correction leads to inaccurate colors, the resulting images become unusable, negating the purpose of scientific cultural heritage photography. More critically, such errors may necessitate re-photographing the artifact, and repeated handling could potentially cause damage. Therefore, for cultural heritage photographers, before shooting for any new media display requirement, beyond mastering photographic techniques and understanding the artifacts' characteristics, they must also comprehend the technical features and requirements of the specific new media technology to capture truly useful and scientifically accurate images, thereby improving efficiency and avoiding rework.

In a standardization test study on the digital acquisition of movable cultural relics conducted by the Palace Museum, the bronze vessel “Battle Scene of Banquet, Fishing, Hunting, and Warfare” was selected as a test subject to capture effective 2D image sequences containing comprehensive structural and textural information. To meet the scientific requirements of cultural heritage photography, a Nikon D3x full-frame DSLR camera was used with an 85mm medium-telephoto lens to minimize lens distortion's impact on post-processing, and an x-rite standard color chart was employed for color correction of all captured images. Additionally, to reduce the impact of light spots on post-processing, a special lighting method was adopted to eliminate reflections. Based on the vessel's shape characteristics, different camera positions (front, top, and bottom views) were selected for shooting, yielding a total of 199 2D images. After post-processing, this image sequence successfully produced a 3D model with textures. This demonstrates that scientific accuracy permeates the entire process of cultural heritage photography and imposes specific requirements on photographic equipment and methods. Compared with the film photography era, modern record-type cultural heritage photography is more complex, requiring clarity, completeness, zero distortion, high color fidelity, and compliance with special requirements for post-processing technologies—it is a process of digital documentation.

[Figure 1: see original paper] 2D Images of the Bronze Vessel “Battle Scene of Banquet, Fishing, Hunting, and Warfare” from the Palace Museum Collection

2.2 Artistic Nature of Cultural Heritage Photography

“Display-type cultural heritage images” used directly for new media presentation emphasize artistic expression and therefore differ from record-type images. Requirements for clarity, completeness, distortion-free imaging, and color accuracy are more flexible, with relatively fewer limitations on photographers. By integrating new media display content and style with the artifacts' own characteristics, photographers can create images through an artistic process that better excavates and expresses the inherent artistic beauty and connotation of cultural relics. While the authenticity and scientific accuracy of the artifacts

themselves cannot be forcibly altered to enhance artistic effects during image capture and post-processing, nor is it necessary to overly emphasize perfect clarity of every detail or the overall form. Instead, special artistic effects can be achieved through emphasizing light and shadow, color, contrast, composition, and even lens distortion to convey the multifaceted beauty of cultural relics.

[Figure 2: see original paper] 2D Images of the Palace Museum's Dian-Cui Inlaid Material Pearl Begonia Butterfly Hair Ornament

3. Conclusion

In the new media environment, analyzing the intrinsic characteristics of cultural heritage photography holds significant importance. Regardless of the new media technology for which cultural heritage images are captured, ensuring scientific accuracy must remain the primary principle, while artistic elements can be enhanced, diminished, or even completely removed according to specific needs. Among the two major types of cultural heritage imagery in the new era, record-type images increasingly provide complete documentation of the most authentic and detailed textures and structures of cultural relics, while display-type images provide more artistically beautiful materials that satisfy the demands of various new multimedia display methods and enrich the valuable digital resources of cultural heritage imagery. This simultaneously places higher demands on cultural heritage photographers and imposes special requirements on the photography profession. Cultural heritage photography is no longer merely the art of photography itself but has become a comprehensive integration of multimedia display technologies, continuously excavating and conveying increasingly comprehensive and colorful beauty of cultural relics as the era develops.

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