

The Changing Of Connotation And Extension Of Photography Through Digital Technology

Changyu Li

Wenzhou Polytechnic, Wenzhou 325000, China

Abstract

Since its inception in 1839, photography technology has undergone numerous changes. Photography is a visual art that combines technology and art. The advent of digital technology at the end of the 20th century has resulted in inflammatory changes to the fundamental principles and techniques of traditional photography, and photography has entered a new era of digital imaging systems. This paper focuses on the changes in photography acquired, created, expressed, and disseminated by digital technology's effect on its connotations and extensions.

Keywords

Traditional Photography, Digital Technology, Digital Darkroom, Connotation, Extension.

1. Introduction

High levels of technological and artistic integration characterize photography as a visual art form. The gradual incorporation of digital technology into photography has resulted in revolutionary and disruptive modifications to photographic equipment, devices, techniques, and shooting methods. China has entered the era of universal photography because of the development of technology and the economy, which has resulted in the lowering of photography's threshold and the blurring of the identities of photographers. As a result of the evolution of digital art, art creation is becoming more integrated and diversified development, and perhaps in the future, visual art will be digitally unified as a new, unified, multifaceted art discipline.

2. The Connotation and Extension of Traditional Photography

2.1. What are Traditional Photographic Techniques

The 1839 invention of the daguerreotype established the fundamental principles and techniques of photographic technology. Traditional photography employs silver halide as a light-sensitive material and has experienced the wet plate, dry plate, and film eras. Traditional photography equipment is large and costly, and the technology is complex and professional, necessitating specialized training to master, making its dissemination difficult. Traditional photography emphasizes pre-production effects and necessitates a high level of photography skill. The traditional darkroom develops and fixes the film to obtain the image, which is a laborious process with a high workload and limited flexibility for later adjustments and re-creation.

2.2. Traditional Photography and the Conflict of Art

In the early days of traditional photography, a group of painters adopted the expression of painting and employed photographic techniques to create portraits, displacing some portrait painters with portrait photographers. This enabled the common man, who could not afford a painter, to have a portrait that was beyond the reach of traditional art, and people sought out the authenticity and intuition of photography. Some completely disregarded photography,

regarding it as a purely mechanical method of image production. They think that photography is a photographic production that reproduces and records facts, and the photographer is a mechanical technician who can only press the shutter button and cannot create an authentic work of art. Photography was viewed as a devil's art and a dangerous innovation. Baudelaire, the founder of modernism, wrote in *The Salon of 1895: The Modern Public and Photography* that photography had become the greatest enemy of the arts... art will soon be replaced by photography, and it may destroy art[1]. In *A Short History of Photography*, Benjamin describes the slanderous attacks on early photography and argues that this foolish rhetoric reflects the banal view of art held by some individuals who reject technological progress and feel trapped by new technologies[2]. Since its inception, photography has been in a constant state of conflict and competition with art, attempting to enter the art category and compete with painting and sculpture.

2.3. Identification with the Art of Photography

The official opening of *Photography: 1839-1937* at The Museum of Modern Art in New York in 1937, represents the beginning of the museum's unrelenting and long-lasting exploration of photography as a media system[3]. The Museum of Modern Art established the first institution-wide photography department in 1940. It was not until the first half of the twentieth century that photography gained mainstream recognition as an artistic medium and began to be collected in the truest sense of the word. The Solomon R. Guggenheim Museum in New York, one of the most important museums of contemporary art, has a catalog of 109 works of photography art out of 129 works acquired between 1990 and 1999[4]. Photography has made the transition from the margins to the center of contemporary art, and the effort has finally paid off.

3. The Impact of Digital Technology on the Connotation of Photography

3.1. The Application of Digital Technology Expands the Photographic Community

Traditional photochemical reactions in photography have been supplanted by digital technology, which has fundamentally altered the imaging principle of images. Digital photography is a collection of electronic data generated by an electronic sensor that is encoded, stored, and processed into an image by a computer. Commonly used equipment for digital photography includes camera lenses, mobile phones, scanners, etc. As a result of the advancement of technology, electronic products are becoming more intelligent, and digital cameras, computers, and mobile phones have become the most popular tools available today. Photography has become an easy-to-grasp and simple-to-use technology since image capture and data conversion are performed automatically by the camera. Everybody can take a clear picture and obtain a satisfactory photograph with relative ease. The technical chasm between amateur and professional photography is closing day by day, allowing amateurs to attain the level of professionals. On 1 December 2016, the State Council of China issued a document abolishing the Ministry of Human Resources and Social Security's photography examinations, further blurring the distinction between professional and amateur photography. Everyone can be a photographer, and the participation thought, and practice of people with a broader range of intelligence is encouraged. They have elevated photography to one of the most influential and central art forms of the twenty-first century. In the era of film photography, this was unimaginable.

3.2. Digital Technology Changes the Concept of Photography

Roland Barthes believed that the true value of photography was its existence. For a long time, photography has been based on the objective world as it exists, and the creation of a photograph

is the reproduction or restoration of something in time and space using science and technology. Presently, the precision and power of digital darkroom technology have impacted the authenticity of photography, and the image editing software represented by Photoshop has completely altered the notion of photography as a true record. The evolution of photography from taking pictures to making pictures, and then from making pictures to virtual pictures[5]. People combine their observations, thoughts, and ideas through a combination of objective photography and post-production, and then use digital technology to reassemble, synthesize, and sublimate the resulting images. This is to achieve a surreal and fantastical photographic work, forming a diverse and distinctive photographic art style.

Digital photography works by Chinese American photographer Li Xiaojing, including the *Man and Beast*, *108 the Multitude*, and *Biological Evolution*, as shown in figure 1 to figure 3 of Appendix A, are created using pre-production and digital darkroom techniques for post-processing. The subjects of these works are a combination of deformed human and animal forms, which are used to imaginatively create new images outside the visual experience[6]. Beginning in 1993, these works were exhibited in art galleries in New York, causing a sensation in western countries. Newspapers and magazines, including *The New York Times*, *American Photo*, *Zoom*, *Art Life*, *Harper's Bazaar*, and *Create Technology*, competed for coverage. The works of Li Xiaogang have been displayed in France, Italy, Japan, Slovakia, Greece, and Taiwan. In addition, her works have been featured in art textbooks published by universities such as Yale in the United States and Oxford in the United Kingdom.

Chen Man, a pioneer of contemporary Chinese visual art, has combined painting and photography using computer post-production techniques, which was formerly the label for Chen Man's photography. Her work's imagination and creativity are energizing and have a strong visual impact. In 2008, the Victoria and Albert Museum in the United Kingdom accepted one of her works, *Astronaut*, into its permanent collection. Figure 4 in Appendix A for the photography work's specifics. Sun Jun utilizes photography as an artistic medium to produce works with the perspective and thought processes of a new literati. Using digital technology, he reintroduces the tranquility and sense of writing of Chinese painting into contemporary life. Sun Jun's photography work has shown in Figure 5 of Appendix A. Sun Jun is known as New Literati Photographer and he has created Chinese painting photography that is not completely divorced from the essence of traditional literati painting but has a new emotional content and aesthetic appeal.

The infinite possibilities of the digital darkroom can break through the photography bottleneck to stimulate people's minds and reveal a more potent imaginative capacity. Digital darkroom opens the door to a virtual world of photography by enabling previously unimaginable effects and artistic expression in a conventional darkroom. *The Two Ways of Life*, which Rejlander created in 1857 by piecing together 30 negatives in a traditional darkroom, was a monumental task at the time, but the same image can now be created in a tenth of the time using a digital darkroom. Digital technology offers a vast and distinctive stylistic language, pushing photography to become a visual language over which the photographer has complete control, thereby reproducing his or her artistic vision in the photographic work. According to artist Jeff Wall said that "*in my photographs, the visual structure seems to dominate the actual events. In my photographs, the real world is subservient to artistic concepts*" [7]. The moment is one possibility for photography, and the absence of a moment is another possibility for comprehending photography, which can serve psychological reality and individual artistic concepts in the same manner as painting. The image is no longer merely a spatial slice of time, it is as malleable in time and space as a painting.

3.3. Digital Technology to Enrich the Expression of Photography

Traditional motion photography is a dynamic image that remains in a still image, such as the Italian photographer Broccolini's series of experimental photographic attempts from 1910, which used heavy bokeh to convey a sense of movement within the image and express dynamic photography. Digital technology has enabled the realization of dynamic photography, also referred to as image map, which refers to the localization of dynamic effects in still photographs. Some photographers have used digital technology to create a series of dynamic photographs that combine photography, post-processing, and artistic creativity. American photographer Jamie Beck, for instance, specializes in motion photography by adding delicate animation effects to a specific image detail, which thaws the original frozen-time stillness and gives the work a dreamlike visual effect.

The US Trademark and Patent Office granted trademark rights for the term Cinemagraph to the Canadian software company Flixel in December 2014. The company developed and produced the user-friendly and entertaining software Cinemagraphpro, which won an Apple Software Design Award in 2014[8]. An artistic and dynamic image is created by capturing a video with a camera, selecting the image as a still, applying a filter effect, and simply processing the image. As a result of the technology's simplification and rising popularity, the production of motion photography is no longer limited to professionals and is rapidly spreading to the masses. The development of digital technology has not only enabled the production of photographic images but has also enabled three-dimensional vision, which is from 3D photography to 3D for the naked eye and VR virtual worlds. The new combination of art and technology provides a new stage for the expression of photographic art, providing the viewer with an immersive experience.

3.4. Digital Technology Expands the Display and Dissemination of Photography

Distribution of traditional photography is restricted to traditional media such as books, newspapers, television, and photographic exhibitions, with limited opportunities, time, and space for dissemination, providing only a limited amount of time and space for some individuals to exhibit their work. This has separated photography from the public, creating a clear distinction between professional and amateur photographers. In the era of the Internet, the combination of photographic magazines and the Internet has evolved into a new space for photographic activity and practice. Numerous professional and amateur photographers are active on the Internet, forming a virtual society with photography as a unifying element and communication link. This virtual society provides a free, independent, and equal space for the display and exchange of photographers, including photography websites, online magazines, blogs, Weibo, and other forms.

The rapid development of internet technology, the independence of image distribution media, the professional upgrade of mobile phone photo functions, and the emergence of many individualized image processing programs continue to excite people and increase their passion for photography. Through this virtual society, people share and exchange their photography. In this space, the photographer is also a connoisseur of the work of others, and individuals inspire, evaluate, and appreciate one another's work. As a result, individual works receive a larger audience and more feedback, and photography becomes a creative medium that satisfies the public's artistic ideals. Photography is a form of art that originates from the public, and the autonomous nature of the online platform will inevitably lead to the creation of photography with more novel ideas, concepts, and styles. Enhancing the vitality of the medium and influencing the evolution and breadth of development in the art of photography, this platform is accessible online.

4. The Impact of Digital Technology on the Extension of Photography

4.1. Cross-border Integration of Creativity

Visual communication design is one of the most common design arts, including packaging, bookbinding, advertising, and posters, among others. As society evolves, technology advances and aesthetic preferences improve, the demand for visual impact, creative techniques, and presentation styles in design increases. Photographic images are the most direct means of expression in visual communication design, and they can be directly applied to a variety of designs. Moreover, photographic images can also be recreated through the designers' vivid imaginations to present a vibrant form. With the advancement of digital technology, images have become more colorful and diverse, exhibiting distinct digital characteristics. The benefits of digital technology in the practical application of contemporary visual communication design are becoming increasingly apparent, and they play a crucial role in promoting the growth of visual communication design.

The interaction between digital photography and visual communication design is reflected in the production process of any photographic act whose purpose is to obtain the photographic material, the source of creation, required for design. Numerous photographers seek the language of the image by employing a design mindset and design language in their work. Consequently, as the final graphic image, it is difficult to differentiate the proportion of design and photography, photographic image, post-production, and design production in it, making it impossible to determine the final attribution of the work. The use of digital photography has greatly broadened the expressive space of visual communication design. Visual communication design thinking has enriched photography's expression by realizing the transgression, mixture, and synthesis of photography and design.

4.2. Cross-border Cooperation in Technology

The development of digital technology has enabled the filming of the nanoworld, thereby expanding the scope of human vision and influencing people's comprehension of the natural world. A nanometer is a billionth of a meter and is not visible to the naked eye, and it can only be observed with a powerful microscope. Wang Xiaohui used the high magnification microscope as a photographic aid to capture breathtaking images that revealed an entirely new visual dimension. Figure 6 of Appendix A depicts the dust-like carbon powder in the nanoworld as a continuous mountain range that resembles sparkling sea water. Fibers are as fine as hair, comparable to a rarely inhabited silk road with a vast wasteland. The nails and hair are ink paintings, while the wilting lotus flower resembles Van Gogh's brushstrokes. The leftover shrimp shells on the table are transformed into a breathtaking view of the sea and sky at sunset. Scientists have referred to nano art as an invisible art, and Wang Xiaohui has figured out how to create art in this technological field. Wang Xiaohui believes that nano art is a collaborative effort between the artist and the viewer and that each viewer will be able to draw a variety of associations from these images and interpret them in their way.

X-rays can see through objects, and X-ray photography uses this technology to help people see and show aspects of objects that cannot be seen with the naked eye alone. This technique is frequently used in the medical industry. Dutch photographer Arie employs this technology to create art. The post-processing of his black-and-white negatives with Photoshop software for coloring, toning, and compositing yields a stunningly beautiful image. His work, which demonstrates the limitless possibilities and enchantment of digital photography, has a technological flavor and the distinct flavor of ink painting. Figure 7 within Appendix A depicts this photography work.

In the digital photography environment, achieving a cross-disciplinary blend of technologies provides photography with more options, transforming it into an all-rounded media that is

more in line with the photographer's quest and a preferred method of creation among contemporary artists. The combination of technology and art will further strengthen their connections and advancements. As the French author Flaubert once foresaw, the artistic station of science and the scientific station of art separated at the foothills and will eventually reunite at the summit.

5. Conclusion

The unification and integration of digital technology are transforming art forms because of the rapid development and widespread use of digital technology. The combination of photography and digital technology has emerged as a departure from photography's traditional language, blurring the boundaries between reality and image and photography and other artistic disciplines. The source of the change in photography is the power of the masses, which has been generated by technological advancement, as photography continues to attract the power of groups with various types of knowledge, and this power aids photography in emancipating its entrenched traditions.

Digital technology's virtual reality creates a vast space for people's imaginations and finds new ways for photographic subjects to express themselves. People invest more effort in the creation of their works, transforming their imagination into visible images, resulting in the creation of photography that is vibrant and replete with innumerable opportunities. Digital photography presents changes and innovations in photographic creation, expanding the expressive capacity of the art of photography, reflecting the development trend of photographic concepts, and redefining the public's perception of photography. Nowadays, photography is essential to innovate not only in terms of form and technique, but also in terms of ideas and content, to produce works that are rich in content, thoughtful, modern, and artistically compelling.

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APPENDIX A



Figure 1. Man, and Beast by Li Xiaojing



Figure 2. 108 the Multitude by Li Xiaojing

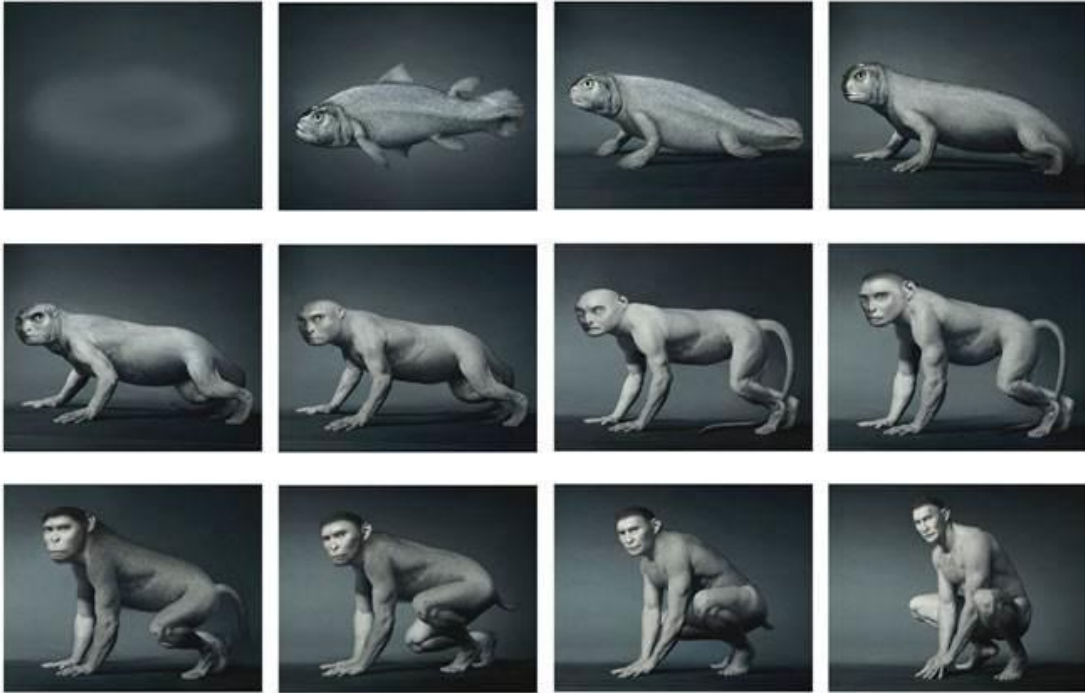


Figure 3. Biological Evolution by Li Xiaojing



Figure 4. Astronauts by Chen Man



Figure 5. Tea Scriptures by Sun Jun

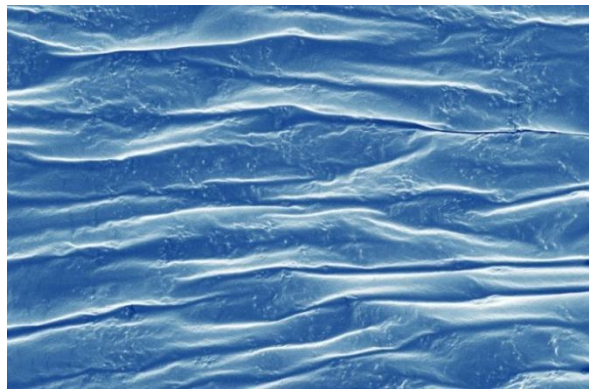


Figure 6. Nano Photography Toner by Sun Jun



Figure 7. X-rays of plants and animals by Arie

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