

Photography Teaching Mode Innovation Assisted by Artificial Intelligence

Long Chen

Chengdu College of Arts and Sciences, Chengdu, Sichuan 610401, China

Abstract: Since its birth in the 19th century, photography has undergone a great transformation from silver-salt photography to digital photography. In recent years, with the breakthroughs in computer vision and artificial intelligence technology, photography technology has entered the era of intelligence, and features such as auto-focus, intelligent exposure, and real-time retouching have greatly improved the creative efficiency and quality of photography. This study aims to deeply explore how AI technology can be integrated into photography teaching, so as to break through the limitations of the traditional model. By analyzing the application of AI in image recognition, intelligent retouching, automatic composition, etc., we explore its potential in teaching, aiming to realize the intelligence and personalization of the teaching process.

Keywords: Artificial intelligence assisted; Teaching photography; Teaching innovation

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1. Status of Artificial Intelligence in Photography

1.1 Image Recognition and Processing

Image recognition is one of the most widely used areas of artificial intelligence in photographic technology. Through deep learning and neural network technology, AI is able to accurately recognize and classify various elements in an image. This includes not only basic object recognition, such as faces, animals, and buildings, but also extends to emotion recognition and scene analysis. This technology has important application value in photography teaching, and AI can help students automatically analyze the composition, light and shadow, color and other elements of the shooting work, providing timely feedback and advice. In terms of image processing, AI has similarly demonstrated strong capabilities. Traditional image processing requires specialized software and complex manual operations, while AI dramatically reduces the difficulty and time cost through automated processing. This is undoubtedly a great help for photography teaching, and students can quickly understand and master the basic principles and techniques of image processing through AI.

1.2 Automatic Composition and Intelligent Retouching

Composition is one of the core elements of photography, and good composition can enhance the beauty and expression of a photo. While traditional composition skills require long-term learning and practice, AI's automatic composition function offers new possibilities. Based on learning from a large number of excellent works, AI is able to recommend the best compositional solutions. Intelligent retouching is another important application of AI in photography. Unlike traditional manual retouching, AI retouching can complete complex retouching tasks in a short time. By learning and analyzing a large number of retouching examples, AI is able to simulate the operation of professional retouchers to automatically complete the skin retouching, background replacement, light and shadow adjustment and other work. This intelligent retouching technology not only greatly improves the efficiency of retouching, but also makes photography teaching more intuitive and convenient, students can quickly see the effect of retouching in practice, and then

understand the principles and techniques of retouching.

1.3 Style Migration and Effects Generation

Style migration is an innovative application of artificial intelligence in the field of image generation, whereby AI can migrate the style of one image to another through neural networks. For example, applying Van Gogh's painting style to an ordinary landscape photo instantly gives the photo a unique artistic style. This technology has great potential for application in photography teaching, where students can understand the characteristics and expressions of different artistic styles through style migration, and inspire creative inspiration.

Special effects generation is an extended application of style migration, where AI can automatically generate a variety of visual effects to make photos more attractive. For example, AI can simulate special effects such as light spots, haze, backlighting, and even generate virtual reality and augmented reality effects. This kind of special effects generation can not only enrich the expressive power of photography, but also be used for teaching demonstrations to help students understand the principles and application scenarios of different special effects.

2. Challenges and Shortcomings of Traditional Models of Teaching Photography

2.1 Uneven Distribution of Teaching Resources

In traditional photography teaching, the uneven distribution of teaching resources is a notable problem. High-quality photography teaching resources are mainly concentrated in economically developed regions and well-known colleges and universities, while the vast number of small and medium-sized cities and rural areas have difficulty in obtaining the same educational resources. This uneven distribution of resources leads to unequal educational opportunities. Many students with photographic interests and potentials are unable to receive systematic photographic education due to the lack of high-level teachers and advanced teaching equipment, thus limiting their development and creative abilities. In addition, there are certain barriers to the access of traditional photography teaching resources. Professional photography equipment is expensive, and many schools and individuals can hardly afford these costs. Photography-related books, videos and other learning materials, too, cannot be widely disseminated due to copyright and cost issues. Even in resource-rich districts, the time and energy of quality teachers are limited, making it difficult to cater for the learning needs of all students. Under such circumstances, many students can only learn through self-study or fragmented online resources, with unsatisfactory results.

2.2 Subjectivity in the Assessment of Learning Outcomes

In traditional photography teaching, the assessment of learning effectiveness relies mainly on the subjective judgment of the teacher. There is often no uniform standard for good or bad photography, and the assessment results are influenced by the reviewer's personal aesthetics and experience. This subjectivity leads to uncertainty and unfairness in the assessment results. Different teachers may have different evaluations of the same work, and it is difficult for students to clarify their true level and direction of progress in their photography skills. Subjective assessment also tends to overlook the creativity and uniqueness of individual students. Traditional assessment criteria pay more attention to the perfection of the technical level and ignore the creativity and expression of the work. Many students with innovative thinking are instead suppressed and find it difficult to realize their creative potential because they do not meet the traditional assessment criteria. In addition, the subjectivity of the assessment results can easily lead to conflicts between teachers and students, affecting the harmonious atmosphere of teaching.

2.3 Monotony and Lack of Interactivity in Teaching Styles

Traditional photography teaching methods are relatively single, mainly relying on classroom lectures and post-class exercises. Teachers teach photography knowledge by explaining photography theory, showing classic works and instructing shooting skills. This teaching method lacks flexibility and innovation, and is difficult to meet the diverse learning needs of students. With limited classroom teaching time, teachers are often unable to explain each knowledge point in depth, and there are great differences in students' understanding and mastery. In addition, traditional teaching methods lack interactivity. Students are more passive recipients of knowledge in the classroom, lacking the opportunity for active participation and communication. In shooting practice, students often operate alone and lack interaction and discussion with teachers and classmates. During the teaching process, students' questions and difficulties are difficult to be solved in time, which affects the learning effect and motivation. This single teaching method also restricts the development of students' creativity and personality. As a kind of artistic creation, photography needs inspiration and innovation. The traditional teaching method pays too much attention to techniques and norms and neglects the cultivation of students' creative thinking. Students learn within a fixed framework, and it is difficult for them to break through the routine and produce novel

ideas and expressions.

3. Photography Teaching Mode Innovation Assisted by Artificial Intelligence

3.1 Individualized Instructional Design

3.1.1 AI-based learner analytics and personalized learning path planning

In traditional photography teaching, teachers are usually unable to take into account the individual differences of each student, and the teaching content and progress are often one-size-fits-all. However, the introduction of artificial intelligence has completely changed this situation. Through big data and deep learning technology, AI can comprehensively analyze each student's learning style, interests and knowledge mastery, so as to customize a personalized learning path for them. Specifically, the AI system can analyze a student's skill level and creative style based on his or her learning records and photography. For example, by analyzing the photos taken by the students, AI can find their strengths and weaknesses in composition, exposure, color application, etc., and recommend corresponding learning contents and practice tasks accordingly. At the same time, AI can also provide personalized learning resources and reference cases according to students' areas of interest, such as landscape photography, portrait photography or street photography. Such personalized learning path planning not only improves students' learning efficiency, but also stimulates their interest in learning and passion for creativity.

3.1.2 Adaptive learning systems and real-time feedback mechanisms

Adaptive learning system is one of the important applications of artificial intelligence in the field of education. In photography teaching, the adaptive learning system can dynamically adjust the teaching content and difficulty according to students' learning progress and feedback, making the teaching process more flexible and efficient. For example, when students encounter difficulties in a certain technical link, the system will automatically reduce the learning difficulty and provide more assistance and tips to help students gradually master the knowledge point. For students who progress faster, the system will increase the difficulty at the right time to challenge the limit of their ability, avoiding the boredom caused by the over-simplification of the learning process. At the same time, the system can also monitor students' learning status and emotional changes in real time, provide timely positive feedback and encouragement, and enhance students' self-confidence and sense of achievement.

3.2 Intelligent Teaching Tools

3.2.1 AI Tutor and virtual assistant applications

In photography teaching, the application of AI tutors and virtual assistants provides students with anytime, anywhere learning support and guidance. AI tutors can interact with students through voice or text, answer their questions, and provide shooting advice and technique guidance. Virtual assistants, on the other hand, can assist students in completing some complex operations and tasks. For example, in the image processing session, the virtual assistant can automatically retouch and adjust photos according to students' needs, providing multiple retouching options for students to choose from. Such intelligent teaching tools not only improve the convenience and efficiency of learning, but also make the learning process more vivid and interesting.

3.2.2 Use of smart shooting devices and software

The application of smart shooting devices and software is another important innovation of AI in photography teaching. At the same time, the smart camera can also analyze the shooting scene in real time, provide shooting suggestions and tips, and guide students to continuously improve their shooting skills in practice. Intelligent software, on the other hand, can play an important role in image processing and creative production. For example, Adobe's Photoshop and Lightroom have introduced a variety of AI functions, such as intelligent retouching, style migration and special effects generation, to help students quickly complete complex image processing tasks. In addition, some specialized photography learning apps, such as Pikazo and Prisma, also make use of AI technology to transform students' photos into works with artistic styles, stimulating their creative inspiration and innovative thinking.

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About the author:

Long Chen (1974.5-), male, Han nationality, Mianyang, Sichuan, master's degree, lecturer, research interests: art, visual communication design, photography.