AI-assisted visual content creation process and optimization practice for short video platforms

Wenyu Sun, Xiaoyu Guo, Yueran Ding

Shandong University of Science and Technology, 250000, Shandong

Received: 10 Jun 2025
Revised: 13 Jun 2025
Accepted: 14 Jun 2025
Published: 15 Jun 2025

Abstract: With the rapid development of short video platforms, content creation has become an important factor in attracting users and increasing platform activity. However, creators face multiple challenges in creativity, efficiency, and quality in video production. The introduction of artificial intelligence (AI) technology provides a new solution for short video creation, especially in the creation and optimization of visual content. This paper studies the AI-assisted visual content creation process and optimization practice for short video platforms, and explores the application of AI in video editing, image processing, personalized recommendation and other fields and its optimization effect. Through the analysis of the AI-assisted creation technology framework, this paper reveals how AI can improve creation efficiency, optimize video quality, and promote the personalized and intelligent development of short video creation. In addition, this paper also analyzes the technical challenges, ethical and legal issues faced by AI-assisted creation, as well as the collaborative relationship between creators and AI. Finally, this paper looks forward to the future development trend of AI and short video creation, and puts forward relevant practical suggestions, providing theoretical guidance and technical support for creators and platforms.

Keywords: Short Video Platform; Artificial Intelligence; Visual Content Creation; Automated Editing; Personalized Recommendations

1 INTRODUCTION

With the rapid development of information technology, short videos, as an emerging form of communication, have quickly occupied people's daily lives. Short video platforms have not only changed people's entertainment methods, but also profoundly affected marketing, education, social interaction and other fields. At the same time, the creation of short video content is also facing increasingly fierce competition. Creators not only need to continuously improve the innovation and quality of content, but also adapt to the changing user needs and platform algorithm updates. In this context, the introduction of AI technology has brought new opportunities for short video creation, especially in the creation of visual content, where the auxiliary role of AI is becoming increasingly important [1]. Through artificial intelligence technology, short video creators can more efficiently perform operations such as video editing, visual effect enhancement, and personalized content recommendations, thereby improving creation efficiency and content quality.

The development of short video platforms shows a trend of diversification and personalization. From the initial single video sharing platform to the current comprehensive platform that integrates multiple functions such as social, live broadcast, and e-commerce, short videos have become one of the mainstream forms of information dissemination [2]. At present, the number of users of platforms such as Douyin and Kuaishou continues to rise, and

the competition between platforms is becoming increasingly fierce. The content creation methods of creators and the content review mechanisms of platforms are constantly evolving. In this process, how to attract the audience's attention within a limited time and improve the dissemination and influence of content has become a major challenge faced by creators [3]. The rapid development of artificial intelligence provides technical support for solving these problems. AI can not only help creators save a lot of time, but also improve the accuracy and attractiveness of the content created, and enhance the interactivity and stickiness of platform users.

The application prospects of AI in visual content creation are very broad. Through computer vision, deep learning and other technologies, AI can intelligently identify, generate and optimize images and videos, and provide creators with a variety of auxiliary functions. AI can automatically recommend editing plans based on users' viewing habits and preferences; through automated image recognition and analysis, AI can help creators find the best visual effects or soundtracks in a short time, improving creative efficiency; in addition, AI can also help creators capture content creation directions with more market potential through sentiment analysis and trend prediction. With the continuous development of technology, AI will play an increasingly important role in short video creation, greatly promoting the intelligent transformation of the entire creative ecology.

2 ANALYSIS OF THE CONTENT CREATION PROCESS OF SHORT VIDEO PLATFORMS

The basic process of short video creation usually includes four main links: topic selection, shooting and production, post-editing, and publishing and dissemination. First of all, topic selection is the starting point for creators to produce short videos. At this stage, it is necessary to formulate attractive creative directions and themes based on the interests of the target audience and the algorithm characteristics of the platform [4]. Creators ensure the innovation and timeliness of content through market research, hot spot tracking and other methods. Next is the shooting and production stage. Creators use tools such as cameras or mobile phones to shoot the required video materials. This process emphasizes the creativity of lens language, scene design, and actor performance. After that, it is the post-editing and processing stage. Creators use video editing software to screen, edit, match music and special effects to the materials to achieve the best performance of the video [5]. Finally, after the video is produced, the creator uploads it to the platform for release and promotion, and uses the platform's recommendation mechanism and social communication to try to obtain a wider audience and interaction.

However, there are also many challenges and problems in the process of short video creation. First of all, short video creation needs to respond quickly to changes in market and user needs. Creators often face great time pressure to produce high-quality content within a limited time. Secondly, the competition between short video platforms is extremely fierce. There are many creators on the same platform. How to stand out from the numerous contents and attract the audience's attention has become a major problem for creators. Furthermore, with the continuous adjustment and optimization of platform algorithms, content creators are faced with the continuous adaptation to platform rules and user preferences, and the direction and style of creation need to be constantly adjusted and optimized [6]. In addition, the diversity and creativity of content are also problems faced by creators. It is difficult for traditional creative methods to break through the creative bottleneck. How to maintain the continuity and innovation of creation is a long-term challenge.

In the creation of visual content of short videos, there are several key factors that determine the quality and popularity of the video. The first is the visual effect of the video, which includes picture clarity, color matching, lens application and other aspects. Excellent visual effects can

attract audiences and improve the viewing experience of the video. The second is the editing rhythm of the video. Reasonable editing can enhance the sense of rhythm of the video, so that the audience can get a strong audio-visual impact in a short time, thereby increasing the attractiveness of the video. In addition, the creativity of the video and the uniqueness of the content are also crucial. Creators need to stand out from many homogeneous contents and provide innovative and personalized creations [7]. These key factors are crucial to short video creation and are what creators need to focus on during the creation process.

There are significant differences between the traditional short video creation model and the AI-assisted creation model. In the traditional creation model, creators rely on personal experience and technology, and manual editing, creative design, special effects addition and other links require a lot of time and energy. In this model, creators have limited creative ability and resources, and are prone to bottlenecks in creation, and the creation process is relatively cumbersome. In the AI-assisted creation model, artificial intelligence technology can help creators automate a large number of tedious tasks, such as automatic editing, intelligent recommendation, sentiment analysis, etc., saving a lot of creative time and improving the accuracy and quality of content creation. The introduction of AI-assisted creation can not only improve creative efficiency, but also provide creators with more abundant creative inspiration and optimization solutions, making the creative process more intelligent and personalized [8]. Overall, the AI-assisted creation model can not only improve creative efficiency and reduce the difficulty of creation, but also promote the improvement of creative quality, help creators break through the limitations of traditional creative models, and achieve more innovative works.

3 TECHNICAL FRAMEWORK FOR AI-ASSISTED VISUAL CONTENT CREATION

The application areas of artificial intelligence in visual creation cover all aspects from image generation to video optimization, greatly expanding the creative space of creators. Specifically, AI can help creators achieve automation and intelligence in multiple links of short video production, including image recognition, video editing, special effects generation, visual content recommendation, etc. AI technology can extract valuable information from the analysis of large amounts of data, helping creators adjust the content of creation according to user preferences, market demand and platform algorithms, and improve the attractiveness and dissemination effect of the content. AI can automatically identify key elements in the video and optimize visual effects based on these elements, or predict the interests of the audience based on historical data, and recommend personalized content creation plans, thereby enhancing the user's viewing experience [9]. Computer vision technology is one of the core technologies of AI-assisted visual creation, which involves how computers understand and process image and video data. Through computer vision technology, AI can identify and analyze objects, scenes, actions, etc. in images, providing intelligent support for video creation. Specific applications include face recognition, target tracking, scene analysis, action recognition, etc. These technologies can help creators process video materials more efficiently and improve the quality of video content. In a video, AI can automatically identify facial expressions and movements of people, and generate dynamic special effects or provide the best editing points based on this information. This automated processing based on computer vision can not only save a lot of creative time, but also help creators achieve higher visual effects and creative levels.

Deep learning and image processing technology are another important application direction of AI in visual creation. Deep learning is an important branch of artificial intelligence.

It can efficiently analyze and process complex image and video data by simulating the neural network of the human brain. Deep learning technology can help AI identify key features in a large amount of video and image data, and generate creative visual effects based on these features. Deep learning can help AI achieve automatic background replacement, style transfer, image super-resolution and other effects in videos. Image processing technology includes image enhancement, denoising, repair and other functions. These technologies can effectively improve the quality of video materials and eliminate defects in the shooting process, so as to make the final content more perfect [10]. Through the combination of these technologies, AI allows creators to easily achieve some effects that previously required complex manual operations to complete, greatly improving the efficiency and effectiveness of visual creation.

The technical architecture of AI-generated artworks has gradually matured and has been put into practical use in the visual creation of short video platforms. The technology of AI-generated artworks is usually based on deep learning algorithms such as generative adversarial networks (GANs). By learning from massive amounts of data, AI can generate highly creative images and videos. AI can show great creativity in artistic style migration, image synthesis, content generation, etc. In short video creation, AI can automatically generate video backgrounds that conform to a specific style according to the needs of the creator, or perform creative editing and special effects design based on the materials provided by the user. In addition, AI can also automatically generate visual works that can trigger emotional resonance based on the emotional response and preferences of the audience, thereby increasing the audience's participation and viewing time. In actual cases, many short video creators have begun to use AI technology for automated video creation and optimization to create artistic short video works. These technical architectures not only enhance the intelligence and automation level of the creative process, but also promote the content diversity and creative development of short video platforms.

The application of AI in the creation of short video visual content not only improves the creator's creative efficiency, but also provides the audience with a richer and more personalized visual experience. With the continuous advancement of technology, the role of AI in visual creation will become more and more prominent, bringing more innovative possibilities to short video creation.

4 OPTIMIZING PRACTICES FOR AI-ASSISTED VISUAL CONTENT CREATION

On short video platforms, with the rapid increase in the amount of content created, how to improve the efficiency and quality of video editing has become a major challenge for creators. The application of AI in automated video editing and editing has greatly improved the efficiency and accuracy of this process. Through deep learning and image recognition technology, AI can automatically analyze the key elements in video materials, such as characters, objects, scene changes, etc., intelligently identify the most attractive clips, and edit them in an automated way. AI can also automatically adjust the editing points according to the rhythm and emotional tone of the video to ensure the smoothness and attractiveness of the video. In addition, AI-assisted special effects and transition effects can reduce the time and

effort required for traditional manual editing while maintaining the overall coordination and creativity of the video content, thereby helping creators complete high-quality video production in a shorter time. This automated editing and editing method greatly improves the efficiency of short video creation, while making the creation process easier and more efficient.

With the continuous optimization of personalized recommendation algorithms, AI has shown great potential in the intelligent recommendation of image and video content. Based on users' viewing history, interactive behavior, and content preferences, AI can accurately predict users' points of interest and recommend creative solutions or materials that meet user needs. This intelligent recommendation can not only help creators customize content according to platform trends and user needs, but also make real-time adjustments based on user feedback. Through AI recommendations, creators can quickly obtain the content themes and expressions that the audience is most interested in, and improve the accuracy and dissemination effect of the content. In addition, AI can also analyze users' viewing time, comments, likes and other behaviors, and adjust the presentation of the video in real time, such as adjusting the video's duration, picture style and soundtrack, to meet the needs of different audiences. This AI-based personalized recommendation not only improves the hit rate of video creation, but also makes the audience's viewing experience more personalized and customized.

In the process of short video creation, the control and optimization of content quality are crucial. AI makes the improvement of content quality more systematic and precise through the introduction of optimization algorithms. AI can monitor and optimize the image quality, audio quality and editing rhythm of the video in real time. Through image enhancement technology, AI can automatically identify noise, blur and color difference in the video, and repair and optimize it to ensure the clarity and visual effect of the video content. In terms of audio, AI can automatically adjust the soundtrack and sound effects according to the content and rhythm of the video to ensure the coordination of audio and picture. In addition, AI can also analyze the audience response of the video, and use sentiment analysis algorithms to determine whether the video content has triggered emotional resonance among the audience, thereby providing optimization suggestions for creators. This AI-based content quality control and optimization enables short video creators to adjust their works in the shortest time possible, ensuring that the quality of creation continues to improve and meets the requirements of platform algorithms and user needs.

The application of AI in short video creation is not limited to the creation stage. Data analysis and effect evaluation of the creation process based on AI also play a vital role. By collecting and analyzing a large amount of creative data, AI can help creators understand the audience's viewing habits, preferences, and content dissemination paths, and further optimize the creation process. Through data analysis, AI can identify the efficient dissemination mode of the video and provide creators with accurate content optimization directions. In addition, AI can also evaluate every link in the creation process, from topic selection, shooting, editing to feedback after release, all links can be analyzed in a data-based manner. Creators can adjust their creation strategies and improve their creation content based on AI feedback, thereby increasing the number of views, interaction rate, and dissemination effect of the video. This AI-based data analysis and effect evaluation not only optimizes the creative process, but also enables short video creation to more accurately meet audience needs and continuously improve

the quality and efficiency of content creation.

Through these AI-assisted optimization practices, short video creation has not only become more efficient and accurate, but also further promoted the intelligent and personalized development of content creation. The continuous advancement of AI technology provides creators with more creative tools and methods, so that every link of short video creation from content conception to release can be optimized and improved, ultimately achieving higher quality work output and wider audience dissemination.

5 CHALLENGES AND PROSPECTS OF AI-ASSISTED VISUAL CONTENT CREATION

As AI technology is increasingly used in short video creation, although it brings many conveniences, it also faces some technical challenges and shortcomings. First of all, although AI has demonstrated strong capabilities in video editing, image processing, content recommendation, etc., it still has certain technical limitations. AI often lacks sufficient understanding and judgment when dealing with complex scenes and dynamic content, especially in the creation of highly creative content, the results generated by AI may not fully meet the creator's intentions. AI may rely too much on existing data models and lack the ability to generate new and unique ideas. In addition, AI's algorithms are still imperfect when dealing with details. The editing rhythm and special effects design of some videos may not be sophisticated enough to achieve the high level of artistic effects expected by human creators. Although deep learning and neural networks have played a huge role in visual creation, AI still cannot completely replace human intuition and aesthetic judgment in some complex emotional expressions and delicate artistic creations.

In addition to technical issues, AI-assisted visual creation also involves ethical and legal challenges. With the popularization of AI-generated content, disputes over copyright ownership and originality have become more prominent. There is still no clear legal framework for whether AI-generated images, videos, and music should belong to the creators, or to the technology providers or platforms. At the same time, AI-generated content may involve infringement issues, and there is a certain gray area in the law to generate new content by imitating existing works. Furthermore, AI may be used improperly to create controversial or immoral content, false information, spoofs, or biased works, which will not only cause public dissatisfaction, but may also lead to legal proceedings or social ethical criticism. Therefore, how to formulate corresponding laws and regulations to regulate the use of AI in content creation has become an urgent problem to be solved.

Although the application of AI in short video creation has brought great convenience, its creativity and the role of human creators are still a topic worth pondering. Although AI can generate eye-catching content through large amounts of data analysis and improve creative efficiency in some aspects, its performance in creativity and uniqueness is still not comparable to that of human creators. Human creators can not only combine personal emotions, cultural background, and social context to create content with depth and connotation, but also give their works unique artistry through unique perspectives and expressions. Although AI can generate content, its creation usually relies on historical data and patterns, and it lacks independent

creative thinking and emotional expression. Therefore, AI is more of a right-hand man for creators, helping them improve their creative efficiency rather than completely replacing human creators. In the future, cooperation between AI and human creators will become the mainstream model. Human creators will use the technical support provided by AI to focus on creativity and artistry, and promote the development of visual content creation to a higher level.

Looking to the future, the integration trend of AI and short video creation will become more obvious. With the continuous development of technology, AI will not only be a tool for creation, but also an indispensable partner in the creative process. In the future, short video creation will be more intelligent and personalized. AI can adjust the style, rhythm and theme of the creative content in real time according to the interests and emotional feedback of the audience, so as to create works that better meet the needs of users. At the same time, AI will provide creators with more creative inspiration, help them discover new creative expressions and art forms, and promote the diversification and innovation of short video creation styles. In addition, as AI technology continues to mature, its application in short video creation will be more in-depth, and the process and effect of creation will be more refined and personalized. Ultimately, the deep integration of AI and short video creation will not only improve the efficiency and quality of content creation, but will also promote the innovation and development of the entire short video industry.

6 CONCLUSION AND OUTLOOK

With the booming development of short video platforms, the application of AI-assisted visual content creation has become an important means for creators to improve their creative efficiency and content quality. This article analyzes the process, technical framework, and optimization practice of AI-assisted visual creation in detail, and explores how AI can help short video creators break through the creative bottleneck and improve the efficiency and quality of content creation through automated video editing, intelligent recommendation, and personalized optimization. AI technology can not only provide data support and technical assistance in the creative process, but also bring creators greater creative freedom and inspiration. With the assistance of AI, creators can focus on creativity and artistic expression, and leave tedious technical tasks to AI, which greatly promotes the intelligence and innovation of short video creation.

However, although AI has shown great potential and advantages in short video creation, it still faces technical, legal, and ethical challenges. AI's creative ability and depth of understanding are still far behind those of human creators, especially in complex emotional expression and artistic creation. AI cannot completely replace humans' unique perspectives and creative intuition. At the same time, with the increase in AI-created content, how to define copyright ownership, avoid infringement, and avoid the risk of AI-generated inappropriate content are still urgent issues that need to be solved. Therefore, the widespread application of AI-assisted creation still needs to be continuously improved and standardized at the technical, legal, and ethical levels.

Looking to the future, the integration of AI and short video creation will be further deepened. With the continuous advancement of artificial intelligence technology, especially

breakthroughs in deep learning, computer vision, and natural language processing, AI will be able to understand the creator's intentions more accurately and provide more diverse and personalized support for creation. In the future, short video creation will not only be more intelligent and efficient, but AI will also help creators to be liberated from the traditional content creation model and help them to create more innovative and personalized content. At the same time, AI will also promote the ecological development of the entire short video industry, and further improve the platform's content recommendation algorithm and audience experience through real-time adjustment of data analysis and creative feedback.

For future research directions, first, the application of AI technology in short video creation can further explore the depth of the combination of creativity and technology. How to make AI better understand the creator's artistic intentions and emotional expressions, and improve the artistry and creativity of AI-generated content; secondly, with the development of AI technology, how short video creators can reasonably use AI-generated content within the legal framework to avoid infringement and ethical issues will be a key topic for future research. In addition, how AI can better cooperate with human creators so that creators can maximize their creative potential instead of relying solely on AI's technical support is also a direction worthy of in-depth discussion.

In terms of development suggestions and practical applications, short video platforms and creators should actively embrace AI technology and use the technical tools and data support it provides to improve creative efficiency and content quality. Platforms should strengthen the innovation and application of AI technology, improve personalized recommendation algorithms, and strengthen regulations in copyright protection, content supervision, etc., to provide creators with a safer and freer creative environment. In addition, creators should regard AI as a partner, reasonably use its advantages in content generation, editing, optimization, etc., and give full play to its creativity and artistry in creation. Overall, the application prospects of AI in short video creation are broad, and in the future it will bring more innovation and development opportunities to the entire short video industry.

REFERENCES

[1] Huang, Y., Lv, S., Tseng, K. K., Tseng, P. J., Xie, X., & Lin, R. F. Y. (2023). Recent advances in artificial intelligence for video production system. *Enterprise Information Systems*, *17*(11), 2246188.

[2] Rahman, M. D., & Ali, M. A. AI in Video Production: From Script to Screen. *Media and Al: Navigating*, 49.

[3] Yu, T., Yang, W., Xu, J., & Pan, Y. (2024). Barriers to industry adoption of AI video generation tools: A study based on the perspectives of video production professionals in China. *Applied Sciences*, *14*(13), 5770.

[4] Alnaser, A. (2024). The Impact of AI-Augmented Image and Video Editing on Social Media Engagement, Perception, and Digital Culture. *Journal of Computational Intelligence, Machine Reasoning, and Decision-Making*, *9*(10), 15-32.

[5] Seneadza, J. S., Arku, Z., Kumi, D. K., Boateng, S. L., & Boateng, R. (2025). AI and Content Creation Research: A Snapshot of What We Know and What We Don't Know. In *AI and the Creative Economy* (pp. 36-62). Productivity Press.

[6] Chung, J. G., Hong, S., Choi, J., & Oh, C. (2025, April). Understanding the Dynamics in Deploying AI-Based Content Creation Support Tools in Broadcasting Systems-Benefits, C

hallenges, and Directions. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems* (pp. 1-28).

[7] Darwich, M., & Bayoumi, M. (2025). AI-Driven Video Quality Assessment and Enhancem ent Techniques. In *Enhancing Video Streaming with AI, Cloud, and Edge Technologies: O ptimization Techniques and Frameworks* (pp. 31-59). Cham: Springer Nature Switzerland.

[8] Santoso, B., & Wijayanti, R. (2024). Human-AI Collaboration in Creative Industries: Wor kflows in Media Production and Community-Driven Platforms. *Transactions on Artificial In telligence, Machine Learning, and Cognitive Systems*, *9*(11), 11-26.

[9] Kavitha, L. (2023). Copyright challenges in the artificial intelligence revolution: Transform ing the film industry from script to screen. *Trinity Law Review*, *4*(1), 1-8.

[10] Anantrasirichai, N., & Bull, D. (2022). Artificial intelligence in the creative industries: a r eview. *Artificial intelligence review*, *55*(1), 589-656.