

# Analysis on the Application of Artificial Intelligence Technology within the Field of Artistic Creation

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**Abstract.** Recently, the swift advancement of artificial intelligence (AI) technology has ushered in profound transformations across diverse fields represented by art design. Against this background, this paper delineates and analyzes the application of AI technology within the sphere of art design, notably its role in the application of graphic creativity. Furthermore, this paper presents a comprehensive exploration of how AI technology reshapes the landscape of art design as well as the novel creative paradigms it introduces to artists. Building upon this foundation, this paper further undertakes a thorough investigation of the challenges confronting AI technology within the field of art design and its future development trends, with a view to furnishing valuable insights for the advancement of relevant domains.

**Keywords-** Artificial Intelligence Technology; Artistic Creation; Graphic Creativity; Development Trend

## 1 Introduction

Art design, serving as an integral component of human culture, encompasses a variety of fields such as painting, sculpture, architecture, and design. Along with the advancement of science and technology, artificial intelligence (AI) technology has progressively permeated the field of art design, offering fresh possibilities for artistic creation[1]. However, despite its contributions to the artistic domain, AI technology inevitably exposes some deficiencies, which need to be systematically addressed through a host of efficacious measures. AI technology, after all, has transitioned into a facilitator of artistic creation rather than a shackle.

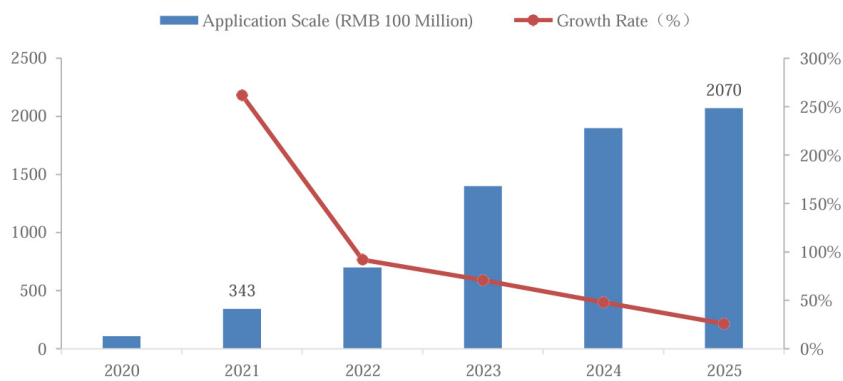
## 2 Application status of AI technology within the field of artistic creation

### 2.1 Increasing frequency of application

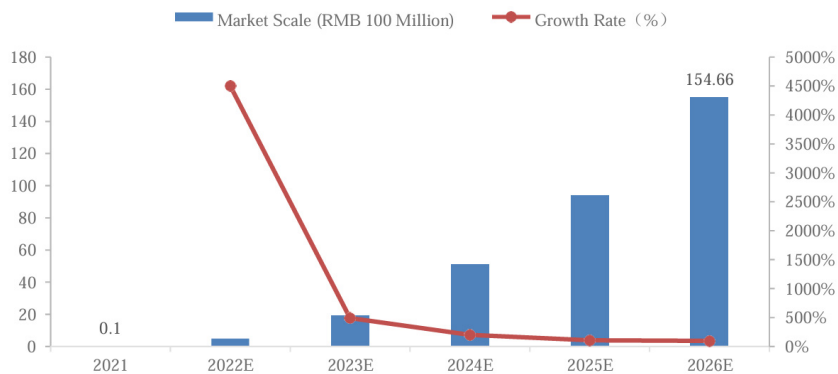
Based on the latest data from QuestMobile, user groups within the realm of Artificial Intelligence

Generated Content (AIGC) exhibited significant growth and activity throughout 2023. As of February 2023, the average monthly usage time and the number of applications used by the foregoing groups surged to 160.5 hours and 36.7 hours, respectively, far exceeding the

network-wide averages. While demonstrating a notable receptiveness to emerging technologies, these users present a full-day activity significantly higher than the network-wide averages, with the activity stable at over 80% during daytime and close to 40% at midnight. Moreover, gauging from the popularity trend of Little Red Book in domestic visual communication social media domain, the daily average readership of AI-related topics exceeds 2 million, with views on AIGC-related topics reaching 290 million and AI painting-related topics reaching 26.7 billion. Notably, approximately 5,000 AI-related posts were generated daily. Concurrently, as per the *Baidu Search Report*, AI-related inquiries averaged 12,354 searches per day over the past six months, marking a 159% year-on-year increase. As a whole, the daily volume of AI-related information over the same period reached 5,629,879, demonstrating a 2,956% year-on-year rise, as illustrated in Figures 1 and 2.



**Figure 1.** Scale and growth rate of generative AI applications in China from 2020 to 2025.



**Figure 2.** Scale and growth rate of AI painting market in China from 2021 to 2026.

## 2.2 Increasing expansion of application scope

AI technology, for one thing, is capable of generating new works of art by learning the characteristics and styles of artworks[2]. A neural network, for instance, can generate new artworks by learning a myriad of artworks, thereby enabling artists to create works with unique styles more swiftly. On the same note, AI technology can be employed for image editing, such

as automatic removal of noise in images, or change of color and texture of images. Simultaneously, AI technology can endow artists with some creative auxiliary means, which is convenient for them to proceed with artistic creation better[3]. An intelligent painting assistant, for example, can quickly generate paintings based on an artist's sketches, thus significantly improving the creative efficiency of the work. Moreover, the intelligent creative evaluation system can help artists improve the quality of their artworks by providing valuable feedback and suggestions. For another, AI technology possesses the capability to prompt artists to comprehend and categorize artworks more precisely by analyzing their characteristics and patterns[4], such as AI algorithms designed for automated artwork classification. Particularly, these AI algorithms are helpful for artists to better display and promote their works through the keen analysis of their styles, themes, and colors.

### 2.3 Mixed public perception of AI application

Data from relevant surveys indicate a positive correlation between respondents' comprehension of AIGC and their working hours. To put it another way, respondents who work longer hours tend to show a higher interest in and understanding of AIGC, with people aged 25-45 serving as the primary users of AIGC. Additionally, professionals in civil engineering, new media, and IT industries demonstrate a relatively high level of understanding and utilization of AIGC. Specifically, users within the new media sector reflect the greatest enthusiasm for AIGC, as depicted in Figure 3. Furthermore, post-usage feedback from respondents highlights several key points, encompassing "poor performance or negligible practical effect", "inadequate hardware infrastructure", "imperfect function or unsatisfactory usability", and "challenges in learning and mastering the tools effectively". In essence, the above-mentioned issues are fundamentally rooted in the imperfection of AIGC product development. Notably, interviewees pointed out the difficulties in precise control of the current AIGC tools as well as the lack of output stability which is perceived as a great disadvantage. These challenges are also evident in the workflow of designers, constituting significant barriers to the deep use of AIGC tools[5], as shown in Figure 4.

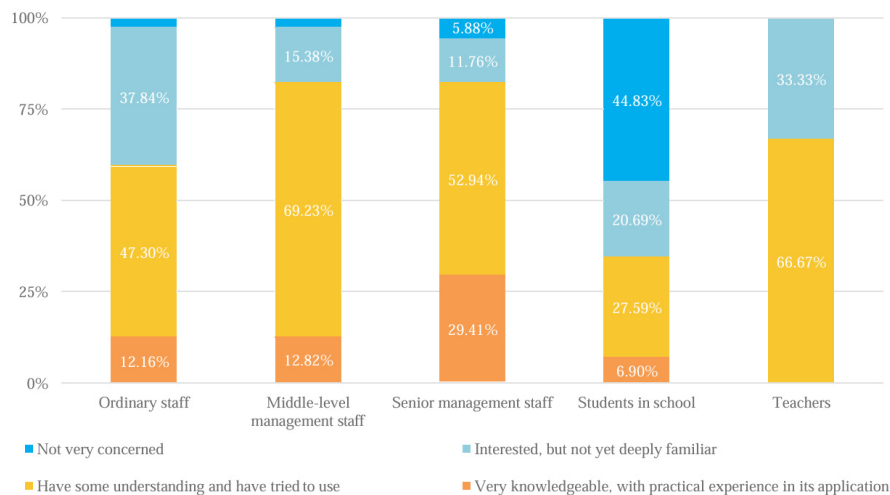
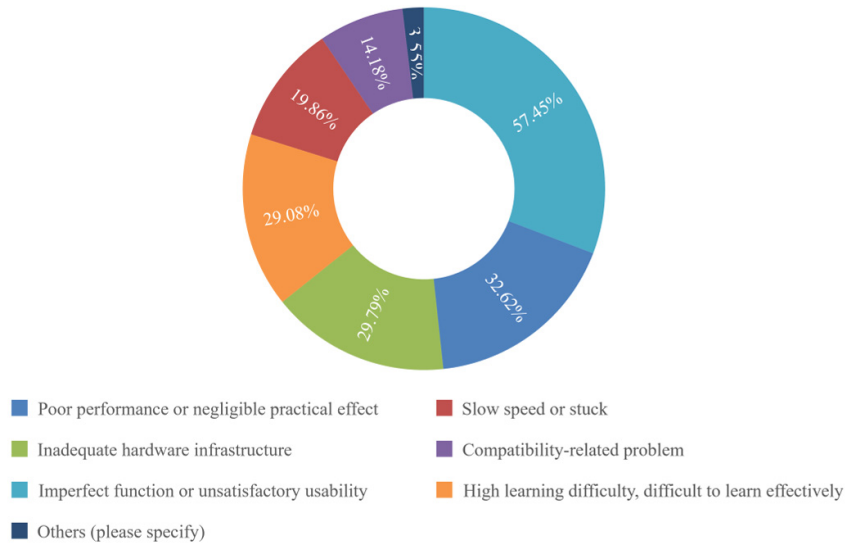


Figure 3. Degree of understanding of AI technology by diverse user groups.



**Figure 4.** Deficiencies of AI technology.

### 3 Impacts exerted by AI technology on artistic creation

#### 3.1 Changes in the way of creation

With the application of AI technology, the way of art design has changed. In this regard, traditional art design typically requires artists to implement artistic creation through their feelings and experiences. By contrast, AI technology can make full use of numerous famous artists by analyzing their creative styles and technical characteristics based on deep learning of their classic works. In this foundation, AI technology can further lay a solid foundation for the generation of new content by means of supervised learning under human subjective preferences through manually marked data, ultimately realizing the simulation of human works[6]. As an example, the pictures generated by AI technology from the perspective of self-portraits of deceased celebrities such as Einstein and Martin Luther King, etc., are actually enough to achieve the level of "confusing the genuine with the fake". Evidently, AI is capable of deeply engaging in literary and artistic creation. More exactly, within the field of literary and artistic creation that requires great creativity, AI can break through the thinking mode, method, and application scope of traditional literary and artistic creation by virtue of its advantages in image recognition, speech recognition, and text processing technology. Meanwhile, through human-computer interaction and collaboration, AI is conducive to stimulating the daring imagination of writers and artists, thus greatly extending their artistic expression and eventually promoting the progress of literary and artistic creation.

#### 3.2 Limitation of creative ideas

While AI technology can infer users' preferences through their behaviors and data, ensuring accurate content recommendations, it falls short in addressing the deeper spiritual and cultural

demands of human beings. Over time, algorithms tend to recommend a plurality of repetitive content, consequently limiting users' exposure to a diverse array of information. Conversely, users' incompetence in receiving richer and more innovative information is not conducive to improving users' quality of cultural life, or urging them to pursue a higher and better quality of life[7]. At this point, Kant proposed the view that "beauty is universally pleasant without relying on concepts" in *Western Aestheticians on Beauty and Aesthetic Sense*, implying that aesthetics is a free activity of imagination and intellectuality amidst coordinated uncertainty. This uncertainty, which primarily revolves around human emotion and subjective consciousness, is beneficial to produce joyous sentiments. Undoubtedly, aesthetics serves as both the activity and the criterion for judgment. For this reason, the standards of human aesthetics are different from those of digital computations. Hence, the beauty perceived by humans is far beyond the scope of digital computations. Consequently, despite AI's proficiency in artistic creation, it may lack the distinctive creativity and uniqueness inherent in human artists, potentially rendering less diversity and innovation in artworks[8].

### **3.3 Crisis concerning ethical copyright issues**

The application of AI technology necessitates substantial data acting as the foundation for further learning and training. Nevertheless, the currently available art datasets still reveal various defects, such as insufficient quality and diversity[9]. At this point, artists, coupled with researchers, must endeavor to collect more high-quality and diverse art data to improve the learning and creative ability of AI algorithms. The application of AI technology, therefore, involves artistic ethics and copyright issues to some extent. Whether the works generated by AI algorithms belong to the artist's original works, for example, remains to be discussed. Briefly, such issues as whether using other people's artworks as training data involves infringement need artists and researchers to reach a consensus through further discussion and establish corresponding legal and ethical guidelines.

## **4 Future development trends of AI technology within the field of artistic creation**

The in-depth application of AI within the field of creative design has spawned numerous future development directions as well as challenges that need to be addressed urgently. Though the application of AI in creative design remains nascent, it exhibits great potential and promise. Moving forward, as AI technology and algorithms continue to advance, they will be able to increasingly simulate human creativity and imagination, thus offering more powerful support for creative design[10]. Concurrently, AI is anticipated to further enhance its interaction with human designers, thereby facilitating greater inspiration and communication. Simply put, the optimization of the following aspects is imperative.

### **4.1 Enriching the expression of emotions and sentiments by AI technology**

Future advancements in AI technology may facilitate a deeper comprehension and expression of emotions and sentiments. In this connection, artists can enable AI algorithms to better perceive and express emotions and emotions through their interaction with AI technology, thus creating artworks with stronger emotional resonance.

#### **4.2 Promoting the diversified and integrated development of AI technology**

Future advancements in AI technology possess the potential to facilitate the integration of art design with multimedia art forms such as music, dance, and film. On one hand, artists can leverage AI technology to create and express multimedia art, thereby creating a broader spectrum of artworks. On the other hand, future AI technology can enable a deeper integration between art and technology. Meanwhile, artists can employ AI technology to realize more innovative and forward-thinking art designs through collaboration and innovation, thus promoting the cross-development of art and technology.

#### **4.3 Addressing controversial risk issues arising from AI technology**

The further development of deep learning technology facilitates the continuous improvement of image recognition technology, which enables the generative model of AI painting to better learn and imitate the characteristics and styles of real-world artworks. Specifically, the artistic creation driven by AI technology constructs a novel artistic form, which is primarily manifested in the rules, steps, and aesthetic styles of creative production. Compared with modernism design, it marks a kind of subversion that sets off a brand-new "change from ancient to modern". In this regard, it is imperative to seek and establish a new naming and discourse system to interpret and define the concept and application space of AIGC and traditional design in the context of AI. Through doing this, a host of controversial risk issues arising from AI technology will be effectively addressed, with the advantages of artistic creation driven by AI technology being brought into play.

### **5 Conclusion**

In summary, the increasingly extensive application of AI technology in the field of art design has opened up new horizons for artistic creation. While fostering innovation and development in the field of art, AI technology brings unprecedented opportunities and challenges to the application of art design. For one thing, AI technology not only facilitates the rapid creation of works with distinct styles but also expands their creative ideas of art design, thereby enhancing the quality of artworks. For another, AI technology encounters various challenges, encompassing the delicate balance between artistry and intelligence, the quality and diversity of available data, and considerations related to art ethics and copyright within the field of art design. Nevertheless, AI technology in the future still holds the potential to achieve a deeper understanding and expression of emotions and sentiments, thus facilitating the integration of art design and multimedia arts and promoting the cross-development of art and technology.

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