Proceedings of ICLLCD 2025 Symposium: Enhancing Organizational Efficiency and Efficacy through Psychology and AI
DOI: 10.54254/2753-7064/2025.BO24157

A Study on the Aesthetic Challenges and Innovative Pathways of Artificial Intelligence Art

Xiaowen Miao

Nanchang University, Nanchang, China
3252384594@qq.com

Abstract: With continuous technological advancement, artificial intelligence art is reshaping the boundaries of artistic creation at an unprecedented pace. Its generative mechanisms, driven by algorithms and vast datasets, not only challenge traditional aesthetics but also provoke profound reflection on the nature of artistic subjectivity and originality. As AI evolves, it is no longer merely an auxiliary tool in art creation; its increasing "subjectivity" prompts humanity to reconsider the fundamental questions of "what is art" and "what is art for." AI-generated works blur the lines between creator and creation, machine and artist, calling into question long-held assumptions about creativity and authorship. Moreover, AI art challenges conventional definitions of beauty and artistic value, while simultaneously opening up expansive new possibilities for the diversified development of future art. Between technological progress and humanistic values, artistic practice must transcend the binary opposition between humans and machines, embracing a new paradigm of human–machine collaborative creation that redefines expression, emotion, and the role of imagination in the digital age.

Keywords: AI art, artificial intelligence aesthetics, artistic subjectivity

1. Introduction

With the rapid development of artificial intelligence technology, AI art has gradually emerged as a burgeoning field in the art world and has become a prominent topic of contemporary artistic discourse. In 2018, the algorithm-generated *Portrait of Edmond de Belamy* was auctioned at Christie's for $432,500. The Obvious team used 15,000 portraits spanning from the 14th to the 20th century as training data, feeding them into a GAN (Generative Adversarial Network) model. These data covered various historical artistic styles, providing the AI with a foundational learning base. This event not only marked the recognition of the commercial value of AI art but also reflected the potential and challenges of artificial intelligence in artistic creation. Traditional aesthetic paradigms emphasize the subjectivity of human agency in artistic production, whereas the emergence of AI art challenges this notion. In *The Work of Art in the Age of Mechanical Reproduction*, Walter Benjamin introduced the concept of "aura," emphasizing the uniqueness and non-reproducibility of artworks. AI-generated works can be mass-produced within a short time span. This technological infiltration brings about not only a revolution in efficiency but also prompts a deep inquiry into the essence of art itself: if algorithms can imitate styles, generate images, and even participate in artistic ideation, have the boundaries of traditional art and aesthetics been fundamentally overturned? This compels us to re-examine the ontological and aesthetic frameworks of traditional art.

DOI: 10.54254/2753-7064/2025.BO24157

Against this backdrop, whether AI art has subverted the definition of traditional art becomes the focal point of debate. In *What Art Is*, Arthur Danto emphasized that the essence of art lies in the expression of ideas rather than in physical characteristics. In brief, his theory asserts that artworks present meaning. Interpretation acts as the medium of transformation, through which ordinary objects are elevated to the status of art—just as the Brillo Box is considered a work of art, while a commercial Brillo packaging box is not. This is closely tied to the debate surrounding AI art. Whether AI-generated works satisfy our core understanding of "art," particularly given the lack of creative subjectivity and emotional expression, remains a subject for in-depth exploration. Moreover, the rise of AI art not only brings about technological breakthroughs but also stimulates discussions concerning humanistic values. Traditional art centers on human ontology, emphasizing emotional expression and the irreplaceability of historical experience, whereas AI creation exhibits characteristics of "simulated subjectivity"—producing works through data collection and algorithmic generation. Thus, aesthetic judgment in the AI era must undergo reconstruction. Within this context, two core questions demand discussion: (1) Has AI art already subverted the definition of traditional art? (2) How can technological advancement and humanistic values be reconciled?

2. Aesthetic challenges of artificial intelligence art

2.1. The dilemma of originality and the questioning of creativity

One of the core controversies surrounding AI-generated art lies in the issue of originality. A report from Oxford University, *The Unreplaceable Power of Human Cognition: Theoretical Drivers Behind Irreproducibility by AI*, notes that AI's learning model is heavily dependent on the accumulation of historical data, and the outputs it generates are essentially recombinations of past information [1]. In the domain of artistic creation, studies have similarly pointed out that AI generates works through massive data training and algorithmic fitting, often mimicking the styles of human artists. This "algorithm dependence" makes it difficult for AI-generated works to escape reliance on human creativity, raising questions about their originality.

For example, the *Portrait of Edmond de Belamy*, generated by a GAN in 2018, was sold at Christie's for $432,500, marking AI art's official entry into the market. However, the essence of the work was the result of training on portrait datasets spanning the 14th to 20th centuries, leading to doubts about its originality. As Benjamin stated in *The Work of Art in the Age of Mechanical Reproduction*, technological replication weakens the "aura" of an artwork [2]; the mechanized nature of AI art generation only exacerbates this issue.

Moreover, there exists a pronounced divergence between public acceptance of "robot painters" and the commercial direction of the art market. On one hand, the market shows great enthusiasm for AI works—such pieces are increasingly disseminated and traded, and more people are willing to pay high prices for them. On the other hand, most individuals remain skeptical about attributing artistic subjectivity to AI. Though AI-generated visuals may impress and satisfy viewers, they are often seen as fundamentally different from traditional artworks—lacking the intuition, emotion, and individual expression of human artists, and thus difficult to accept as genuine art.

2.2. The crisis of artistic subjectivity

Margaret Boden, in *The Creative Mind*: Myths and Mechanisms, identifies creativity as one of the core characteristics of art [3]. However, AI does not possess the "creative power" to use artistic expression as a vehicle for emotion in the way human artists do. It remains fundamentally constrained by pre-set datasets provided by humans, reinforcing its algorithm-dependent nature.

AI art's "absence of intention" is reflected in two main aspects: first, AI lacks the intrinsic motivation to create and merely executes tasks based on programmed instructions; second, even when

DOI: 10.54254/2753-7064/2025.BO24157

AI can learn and mimic certain styles or themes, the meanings conveyed through the works still derive from the human designer's thinking and interpretation. In other words, AI remains in a passive position in the creative process. AI-generated art ultimately cannot exist independently of human involvement, as it lacks both the desire for self-expression and the capacity for autonomous creation. This absence of subjectivity necessitates a reconsideration of the criteria used to evaluate artistic works. As AI art evolves, traditional evaluation models based on the artist's identity may give way to metrics of "algorithmic explainability"—where the value of art may increasingly depend on the uniqueness of algorithm design, the depth of data training, and the complexity of human-machine interaction [4].

2.3. Ethical and socio-cultural disruptions

The rise of AI art challenges not only the definition of traditional art but also gives rise to a series of ethical and socio-cultural issues. Among the most contested is the question of copyright ownership. Currently, there is no unified legal standard regarding the rights to AI-generated works. For example, in 2023, the U.S. Copyright Office issued guidelines explicitly stating that works generated entirely by AI are not eligible for copyright protection—only those AI-assisted works that contain "elements of human authorship" may qualify [5]. This has also triggered concerns over the devaluation of artistic labor: when AI can autonomously produce artworks, what roles will traditional artists play? Does artistic creation still hold economic value?

In addition, AI art poses a potential threat of cultural homogenization. The prerequisite for AI artistic creation is extensive "training," which is often based on existing artworks. As a result, the generated outputs tend to exhibit stylistic similarities. For instance, Kate Crawford found in her analysis of various GAN-generated artworks that due to similarities in the training datasets, these works often showed high consistency in color schemes, composition, and visual themes [6]. This suggests that, despite its ability to generate rich visual content, AI remains confined by data and instructions, and may encounter bottlenecks in aesthetic diversity and stylistic evolution. If AI art were to dominate the future market, and if AI cannot break through its "information barrier" to engage in autonomous creation, this homogenization trend could weaken cultural diversity and hinder artistic innovation.

In summary, AI art faces serious challenges in terms of originality, artistic subjectivity, and socio-cultural impact. While it is gradually gaining acceptance in the market and among the public, its lack of independent creative capacity makes it difficult to meet traditional aesthetic expectations regarding artistic subjectivity. Moreover, issues such as copyright ownership and cultural homogenization require further exploration and resolution. Thus, balancing technological innovation with humanistic values has become a key issue in the development of AI art.

3. Innovative pathways of AI art

Traditional aesthetics, due to the absence of subjectivity in creation, refuses to recognize AI-generated works as legitimate forms of artistic creation. At present, this stance appears to hold some validity, as AI is still constrained by data and external commands in the creative process. However, with the continuous advancement of technology, AI's flexibility and algorithmic complexity have been steadily improving, prompting some scholars to question the notion that AI cannot possess the status of an "artist." Galanter points out that AI not only has the ability to generate artworks but can also "learn" from audience feedback and adjust its creative strategies accordingly, which may suggest a certain level of artistic subjectivity. Furthermore, if AI can autonomously evolve its creative style without external control, it could be said to possess a form of "weak subjectivity" [7]. Therefore, AI is not merely a tool to assist human artistic creation—it can shape new artistic paradigms and expand

DOI: 10.54254/2753-7064/2025.BO24157

modes of artistic expression and experiential mechanisms. As AI continues to evolve, it holds the potential to transition from an auxiliary tool to one of the creative agents, exploring new artistic possibilities alongside human artists.

3.1. Technological breakthroughs

The development of AI art is grounded in continual breakthroughs in core technologies, such as Generative Adversarial Networks (GANs) and style transfer techniques. These advancements not only enable innovation in visual presentation but also influence the perception of subjectivity in artistic creation. GANs, proposed by Goodfellow and colleagues in 2014, allow AI to autonomously generate artworks with complex aesthetic characteristics through adversarial training between a generator and a discriminator, even in the absence of specific templates [8]. A notable example is the Obvious team's Portrait of Edmond de Belamy, created using GANs. By analyzing a large dataset of historical portraits, the AI generated a work with a classical style not attributable to any specific artist. Style transfer, on the other hand, uses algorithms to fuse and apply artistic styles from different periods and schools onto images, thus transcending the traditional constraints of style and individual artist identity. For instance, Google's DeepDream project combines deep learning with visual art to produce dreamlike artistic images [9]. While AI lacks the emotional depth and motivation emphasized in traditional art, its "unconscious production" challenges the long-held belief that human artists solely possess creative subjectivity.

Moreover, AI's involvement has propelled interactive art into a new phase, further diluting the artist's role as the sole creative subject. Mario Klingemann's interactive work Neural Glitch exemplifies this transformation: the viewer's input directly determines the artwork's real-time changes and final presentation [10]. In this process, art is no longer solely the product of human intention—data and algorithms become active participants, undermining the conventional notion of the artist as the exclusive creator.

3.2. Innovation in creative models

The rapid development of AI art has also facilitated the rise of human-machine co-creation models, breaking away from traditional art's focus on individual artistic intention and solitary creation. With AI's involvement, the artistic process has shifted from being closed and individualistic to open and collaborative, marking a significant transformation in creative methodology. In this collaborative model, artists and AI no longer exist in a replacement dynamic but engage in a mutually supportive partnership in artistic production. Mazzone and Elgammal argue that AI functions as a "creative catalyst" in this context, not only sparking artistic inspiration but also producing unforeseen visual outcomes that expand the boundaries of artistic creation [11].

Refik Anadol's *Machine Hallucinations* is a representative example of this collaborative approach. By integrating AI with vast datasets and employing algorithms such as DCGAN, PGAN, and StyleGAN, Anadol explores the synergy between human consciousness and machine intelligence in the creative process. He views the machine as a co-creator of human consciousness, using AI to mine the unperceived layers of external reality and offering audiences a novel sensory experience. At the same time, he retains control over the overall direction and intent of the work. This suggests that AI does not replace the artist's subjectivity but rather acts as a powerful assistant, enabling artists to transcend traditional and personal cognitive boundaries and pursue more diverse and innovative forms of expression.

Concurrently, the distributed model of artistic production has emerged as another key direction in AI art innovation. Traditional art creation often stems from the independent efforts of individual artists. However, with the advent of the internet and open-source technologies, art is increasingly

DOI: 10.54254/2753-7064/2025.BO24157

being shaped by the collective intelligence of algorithmic communities. Artists and programmers worldwide can collaborate by sharing neural network models, jointly training and refining AI systems, and facilitating cooperation that spans geographic, cultural, and temporal boundaries. AI painting communities and open-source AI art platforms are propelling artistic creation into a new era of exchange and sharing. As Brynjolfsson and McAfee note, distributed creation not only enhances the diversity and complexity of artistic works but also fosters the interaction and integration of different artistic cultures [12]. This model likewise challenges the traditional belief in the individual artist as the sole creator.

3.3. Reconstructing aesthetic theory and artistic evaluation systems

As AI becomes increasingly embedded in the field of artistic creation, traditional aesthetic theories are facing unprecedented challenges. AI is not only altering the methods of artistic creation but also prompting humanity to reconsider and redefine core issues such as “the essence of art,” “the subject of artistic creation,” and “artistic evaluation.”

Traditional aesthetics has long regarded art as a direct expression of individual emotion and intention. However, artificial intelligence, as a non-human intelligent agent, inherently operates in a decentralized and emotionless manner. In the post-humanist context, artistic creation is no longer confined to the human individual; it can now be understood as a network system of “distributed subjectivity” [13]. This challenges the traditional paradigm of “artist supremacy” and provides theoretical support for expanding the boundaries of artistic creation.

This distributed subjectivity aligns with the central tenets of post-humanist theory: rejecting anthropocentrism and emphasizing the co-creation between technology, nature, the other, and humans. The further deconstruction of the traditional role of the artist requires a re-examination of long-standing ontological assumptions about art. In AI-generated art, human artistic motivation and emotion are downplayed, while algorithmic training, data input, and machine learning models become indispensable elements of the creative chain. Art is no longer solely the expression of an artist’s emotions. Additionally, the audience itself becomes a vital component of the distributed subjectivity network. The subject of art has thus evolved from a singular “human individual” into a dynamic, fluid network system, offering new interpretive pathways for the philosophy of art.

Furthermore, as AI art continues to evolve, the traditional frameworks for evaluating art are also being challenged and reconstructed. Conventional aesthetic evaluation often relies on subjective judgment, emphasizing individual emotional experience and intuitive response. Computational aesthetics, by contrast, tends to distill aesthetic evaluation into quantifiable, programmable rules and models, attempting to objectively analyze the formal features of artworks through algorithms. Yet beyond algorithms and data lie elements infused with the emotional imprint of human creators, which demand a new evaluative framework.

The core of reconstructing artistic evaluation lies in moving from a single “formal dimension” model to a hybrid framework that incorporates both “cognitive” and “experiential” dimensions. This new system seeks to capture the formal characteristics of artworks while also considering the audience’s emotional responses. It rejects confining artistic evaluation to either cognitive or experiential unidimensional indicators, instead advocating for a dynamic tension between the two. Such a system promotes openness and diversity in evaluation standards. It acknowledges the unique creative capabilities of AI while preserving the leading role of human aesthetic subjects in interpretation and perception.

DOI: 10.54254/2753-7064/2025.BO24157

4. Future prospects and reflections

Looking ahead, the development of AI-generated art will continue to exhibit a duality between technological advancement and humanistic values. On the one hand, emerging technologies such as quantum computing and multimodal integration are expected to introduce new dimensions to artistic creation. The principles of superposition and entanglement inherent in quantum computing offer exponential scalability and unprecedented creative space for AI generative algorithms [14]. For instance, a quantum computing system with 30 qubits can theoretically encompass approximately 10^{30} possibilities. Compared to traditional generative adversarial networks, such a system boosts computational speed by 24 orders of magnitude [15]. This capability enables AI to explore more intricate forms and structures in artistic creation, resulting in highly innovative works. The introduction of quantum random number generators further endows AI's decision-making process with unpredictability, meaning that the creative process may be influenced by quantum fluctuations, thereby increasing the randomness and uncertainty of the outcome.

An illustrative example is the work *Schrödinger's Canvas*, which demonstrates how quantum computing can function within artistic production. In this piece, 30% of the plot development is determined by quantum fluctuations, enabling the AI-driven creative process to transcend a purely rational framework and instead rely on the unpredictable nature of quantum phenomena. This shift means that AI is no longer merely a tool that imitates human creativity, but rather begins to exhibit a form of "physical unpredictability." This phenomenon compels a reconsideration of a profound question: as the decision-making process of AI becomes physically unpredictable, does this signify the emergence of a new "post-human artistic subjectivity"? Simultaneously, this progression is accompanied by growing skepticism. As quantum computing and AI collaboratively reshape the form of art, an unavoidable issue arises—human intention within artworks is increasingly displaced by quantum mechanisms and artificial intelligence, thereby weakening the spiritual connection between the creator and the creation. Consequently, AI-generated art may become more focused on demonstrating technical parameters and algorithmic processes, while neglecting the humanistic values that artworks ought to embody. This could result in a situation where "form outweighs content," allowing instrumental rationality to obscure the cultural and emotional significance of art.

On the other hand, as AI continues to engage in artistic creation, the redefinition of the nature of art itself becomes a key topic for future inquiry. The traditional question of "what is art" is becoming increasingly ambiguous. As machines are capable of generating works that are aesthetically indistinguishable from those created by humans, the applicability of conventional definitions to differentiate art from non-art becomes uncertain. In contrast, the question of "what is art for" assumes greater practical relevance, shifting the focus toward the function, role, and purpose of art. Rather than seeking to define its essence, it emphasizes the real-world impacts of art on society, culture, and psychology—for example: how does art shape cognition? How does it drive social transformation? Moreover, despite continuous technological innovation, humanist aesthetics remain an indispensable spiritual foundation of art. The European Commission, in *its Ethics Guidelines for Trustworthy AI*, explicitly states that while promoting technological innovation, AI applications must adhere to principles of transparency and human oversight, in order to prevent technological monopolies and cultural homogenization [16]. Such institutionalized standards offer the art world a mechanism to balance technological and humanistic values. Future artistic development should strive to build a new symbiotic model of "technology and humanity," focusing not only on the technical form of AI-generated art but also on its humanistic core, thereby preserving and transmitting the emotional, inspirational, and original values rooted in traditional aesthetics.

DOI: 10.54254/2753-7064/2025.BO24157

5. Conclusion

As AI-generated art challenges traditional aesthetics, it provokes reflection on artistic subjectivity and originality. Throughout its evolution, AI art presents a set of aesthetic challenges centered on the blurring of artistic subjectivity, the shift in creative modes driven by technological empowerment, and the conflict between human emotion and instrumental rationality. At the same time, it opens new possibilities: AI can be more than just a creative tool—it also has the potential to participate in artistic thinking, aesthetic construction, and even philosophical reflection, encouraging humanity to reconsider the fundamental question of "what is art." In today's historical context, faced with the dual nature of AI-generated art—as both a challenger and a co-creator—artistic practice should transcend the binary opposition of human versus machine, and instead explore a new paradigm of human–machine collaborative creativity. Moreover, in an era marked by rapid technological advancement, a genuine response to the aesthetic propositions posed by AI-generated art requires sustained critical reflection and interdisciplinary dialogue. Only through such efforts can a path of innovation be forged amid these emerging challenges.

References

[1] *Oxford University Report, "The Forces That Can't Be Replaced by AI: The Theoretical Drive of Human Cognition."*
[2] *Benjamin, W. (1936). The Work of Art in the Age of Mechanical Reproduction.*
[3] *Boden, M. (1990). The Creative Mind: Myths and Mechanisms. Routledge.*
[4] *Qiu, Z., & Legrady, G.(2023). "Human-AI Co-Creation in Interactive Art Installations". ACM SIGGRAPH Conference Proceedings.*
[5] *U.S. Copyright Office. (2023). Copyright Registration Guidance for Works Containing AI-Generated Material.*
[6] *Crawford, K. (2021). The Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence.*
[7] *Galanter, P. (2016). "Computational Aesthetics: AI and the Evolution of Art". Leonardo, 49(5), 430–437.*
[8] *Goodfellow, I., Pouget-Abadie, J., Mirza, M., Xu, B., Warde-Farley, D., Ozair, S., Courville, A., & Bengio, Y. (2014). Generative Adversarial Networks.*
[9] *Mordvintsev, A., Olah, C., & Tyka, M. (2015). Inceptionism: Going deeper into neural networks (Google DeepDream Project).*
[10] *Klingemann, M. (2019). Neural Glitch Series.*
[11] *Mazzone, M., & Elgammal, A. (2019). "Art, Creativity, and the Potential of Artificial Intelligence". Arts Journal.*
[12] *Brynjolfsson, E., & McAfee, A. (2017). Machine, Platform, Crowd: Harnessing Our Digital Future.*
[13] *Qiu, Y., & Zhang, Y. (2019). The reconstruction path of artistic subjectivity in the posthuman context. Literature and Art Studies.*
[14] *Aaronson, S., & Liu, Y. (2023). Quantum Superposition in Generative Art. Cambridge University Press.*
[15] *Biamonte, J., et al. (2017). Quantum machine learning. Nature, 549(7671), 195-202.*
[16] *European Commission. (2021). Ethics Guidelines for Trustworthy AI*