

Technical Paper

Influence of Artificial Intelligence on Art From Perspective of Creativity and Originality

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Abstract: The history of art mirrors societal, religious, political, and technological evolution. From prehistoric cave paintings, which conveyed human experiences and rituals, to ancient artworks in Egypt, Greece, and Rome, art has long reflected cultural values and power dynamics. Technological advances, such as the use of bronze and marble, enabled larger and more enduring works, while the Middle Ages were dominated by religious themes in Christian and Islamic art. The Renaissance shifted focus to realism and secularism, supported by innovations such as linear perspective and oil painting. Baroque and Rococo art, characterized by emotional and elaborate styles, reinforced the power of monarchies and the Catholic Church. In modern times, industrialization and political upheavals inspired artists to challenge traditional norms, with technologies like photography and digital media expanding artistic expression. Artificial Intelligence (AI) has recently become a key tool in art, capable of generating music, visual art, and literature. Programs like GPT and DALL-E push the boundaries of human-machine collaboration, raising questions about creativity, originality, and ethics. While AI enhances efficiency, concerns about job loss, bias, and intellectual property emerge, especially in the creative industries.

Keywords: AI; Creativity; Originality; Art

1. Introduction

The history of art reflects cultural, religious, political, and technological development and changes in multifaceted fields. In prehistoric art, paintings, carvings, and sculptures on the walls of caves were created presenting human experiences and beliefs. Such prehistoric artworks also reveal ritualistic significance. As tools and pigments were developed throughout, sophisticated artistic expressions were enabled. Ancient art is represented by artworks of Egypt, Mesopotamia, Greece, and Rome which show the values, myths, and social structures of the times. In that age, religion was intertwined with artworks. For example, Egyptian art revealed various features or expectations of the afterlife, while Greek art described the pantheon of gods mainly. Rulers used art to authorize their power, as seen in Egypt's pyramids and Rome's triumphal arches. Advances in engineering and new materials such as bronze, steel, and marble were utilized to create larger and more durable artworks than before. In the medieval era, Christianity and the feudal system in Europe dominated art, while Islamic art did in the Middle East. European art is symbolized by Christian iconography in churches. As figurative representation was banned in Islamic art, diverse calligraphy and geometric patterns were created. In the era, art was a means to show the power and piety of rulers as found in the mosaics and stained glass windows in Byzantine churches. The stained glass windows and illuminated manuscripts represent the technology used in the art of that age to enrich artistic expressions and beautify artworks. In the Renaissance, realism and human experience were emphasized. Still largely influenced by Christianity, Renaissance artists also explored and presented secular and human aspects in their artworks. Many artists were supported by powerful politicians, families, or churches who were wealthy and ruled city-states and the Church. New artistic techniques emerged in the era including linear perspective, chiaroscuro, and oil painting which revolutionized the visual arts. In the Baroque and Rococo ages, dramatic, elaborate, and emotional artworks, and playful and vivid ones were found, respectively, which show the counter-reformation to inspire people's Christianity. Monarchies and the Catholic Church utilized art to convey power and divine right. Printmaking was invented in the ages and allowed for more diverse and creative artistic ideas in artworks. Modern art is represented in industrialization, urbanization, and global conflicts. Artists paid more attention to individual experiences and political expression. From totalitarian to avant-garde, new societal norms challenged the traditional concept of art. New technologies such as photography, movies, and digital technologies are used for the creation and dissemination of artworks in myriad genres. (Castillo, 2000; Platt, 2016; Camille, 1996; Landaue, 1994; Blunt, 1962; Bull and Galimberti, 2022).

In the previous studies on art history, it is easily found that societal changes and technological developments have significantly affected artworks in each era through history, and the influence on art presented how technology was utilized to create, augment, and inspire art. Thus, it is also required to review the recent technology and its effect on modern art from various aspects including creativity. Recent technology is now represented by artificial intelligence (AI).

The term "Artificial Intelligence" was coined in 1956. Early AI research results were not more than symbolic with a focus on puzzle-solving, proving theorem, and game-playing. Until the 1980s, AI had not been developed significantly due to limited computational power and idealistic expectations. However, in expert systems and neural networks, researchers managed to make meaningful progress. Since the 1990s, research on AI has started to produce prominent results by improving algorithms, computational power, and constructing huge datasets. In 1997, IBM's Deep Blue defeated chess champion Garry Kasparov which captivated the world and appeared AI on the spotlight. Recent developments in machine learning, hardware, and enormous data are evolving AI in healthcare, finance, transportation, business, art, and literature (Macarthy et al, 1956; Roser, 2022; Chess.com, 2018). Recently, AI is used to generate art, music, and literature, delimiting the boundaries of creativity and human-machine collaboration. Programs such as OpenAI's GPT can write coherent text, while DeepArt and DALL-E create visual art. In the future, artificial general intelligence (AGI) is expected, which can learn and apply knowledge similar to human cognitive abilities for doing diverse tasks. Even though AI is efficient and productive with data-driven decision-making and task performance, AI needs to align with human values and ethical standards through transparent and accountable systems. Concerns about job losses in certain industries, the biases and misuses of AI, and infringement on privacy rights are increasing in society due to its rapid development and widespread (Esteva et al., 2019; Bostrom and Yudkowsky, 2014; Elgammal, 2017; Roser, 2022). In art, regarding the use of AI, there has been a debate on creativity and authenticity. As AI models learn from existing human works, a question on whether AI-generated art and literature can be considered creative or original. This is also related to intellectual property such as copyright and ownership. AI-generated content can undermine human creativity, which can be economic and social challenges for human artists (Floridi and Cowls, 2019).

AI has brought major technological advancements in history. It is used for creation, too, challenging existing paradigms of art and prompting debates on the nature of art in which AI intervenes. The acceptance and integration of AI in art trigger an ongoing discussion among artists, critics, and the public, as well as educators from the perspectives of how to perceive AI in terms of art creation. Thus, in this article, such an issue is discussed through various literature. The discussion in this article provides the basis for understanding the role of technology and a way of using it in art by artists.

2. AI in Art

AI has introduced new forms of creativity that may not be conceived by human minds alone. AI can inspire artists to have creative ideas and motifs but challenges traditional concepts of art. Artists can use AI as a tool or even a co-creator, blending human intuition with machine precision, and AI enables people to engage in art creation. However, its ability to autonomously create artwork casts ethical and philosophical questions about authorship and creativity. Several artists embrace AI for its potential to demolish creative boundaries and collaborate in innovative ways but others worry that AI devalues human creativity or leads to artistic job loss. In general, the public seems attracted by AI's artwork which is being accepted as people become more familiar with it owing to the proliferation of AI-generated artwork. When AI becomes prevalent in the future, artists may have to understand its use and implications, and even its technological backgrounds (Elgammal et al., 2017; McCosker and Wilken, 2020; Guo et al. 2023).

DeepArt is an AI platform that creates artwork using neural transfer. In its platform, the style of one image is transferred to the content of another image. Figure 1 shows an artwork that was created by DeepArt (EPFL, 2024; Gatys et al. 2015).



Fig. 1. Paintings created by DeepArt using the original picture of Vincent van Gogh's *Starry Night*. (EPFL, 2024).

Artificial Intelligence Creative Adversarial Network (AICAN) is a creative AI system that uses a generative adversarial network (GAN) to produce artworks using learned styles and create artworks in various artistic styles (Figure 2) (Elgammal et al. 2017; The Centre International d'art Contemporain de Montréal, 2024).

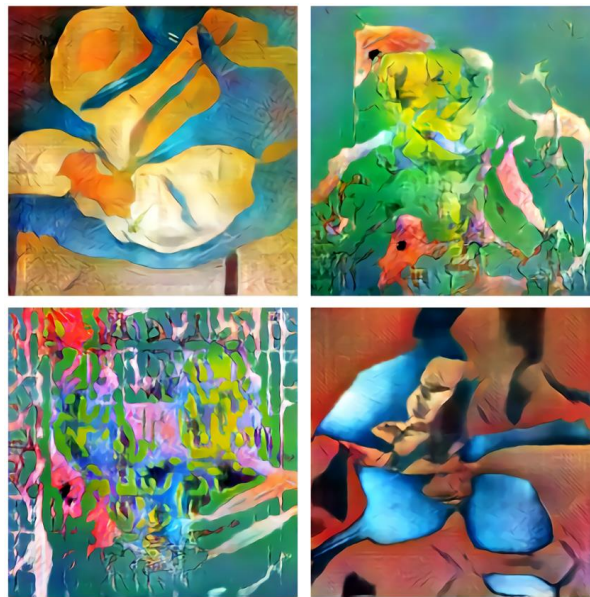


Fig. 2. Paintings created by AICAN (upper left: Freya, 2018; upper right: Green Genesis, 2018; lower left: Tropical Inception, 2018; lower right: Flora, 2018) (The Centre International d'art Contemporain de Montréal, 2024)

There are mixed reactions to those paintings created by AI. Several artists acknowledge new creative expression and collaboration, while others are concerned about originality. The public seems to enjoy the novelty and accessibility of personalized art. Huang and Rust (2024) discussed the evolving AI art and debated surrounding artistic autonomy and authorship. Though AI's creativity is disappointing due to its copying existing artworks, its conceptual implications can maximize novelty through strategic reward mechanisms. They proposed a way to evolve AI from generative to creative using a triple prompt-response-reward engineering framework. AI can produce stylistically novel and culturally significant art and exhibits a growing acceptance and enthusiasm in the art community and the general public. However, AI must learn about artistic styles by analyzing existing art and become creative by intentionally deviating from the learned styles. Humans cannot easily distinguish art generated by AI from contemporary artists' works (Elgammal et al, 2017). Therefore, ethical considerations and intellectual property related to AI-generated art need to be validated by providing clearer guidelines and policies than the present ones to answer the questions of ownership and authorship in AI-created works. AI's role in artistic creation is expanding with its potential while there are concerns about authenticity and the impact on traditional artistic practices (Piskopani et al., 2023).

3. Critics and Supports for AI Artworks

AI lacks genuine creativity and cannot produce original art on its own. Therefore, AI-generated artworks are regarded as derivative ones as they are based on what it has learned from existing human-created artworks. AI also lacks the intentionality and emotional depth that are found in human creativity. Thus, it is not easy for AI to have the same authenticity as human-created works (Piskopani et al., 2023). There are ethical concerns regarding the originality of AI-created art as their ownership is largely debatable. For AI-generated art to be more widely accepted, ethical implications and intellectual property challenges must be solved with appropriate guidelines and policies (McKernan and Wilken, 2019). AI-generated art also undermines the value of human artists' work, causing a fear that the market can be disrupted by low-cost, high-volume AI-generated art (Elgammal et al. 2017).

On the contrary, AI is regarded as a creative partner that helps artists overcome the limitations of traditional art forms and explore new artistic presentations. AI makes art creation more accessible to the general public who has not been trained. This democratization in art can create an inclusive and diverse art community that disseminates art and enlarges the market more widely and effectively than before (Gatys et al. 2015). AI can be a new tool to create new artistic expression. With repetitive and technical creation, artists can create more artworks with improved creativity and new conceptual and emotional presentation (Brown et al., 2020). Recently, The generative pre-trained transformer (GPT) of Open AI demonstrates how AI assists in literary creation by

providing generated ideas to overcome creative blocks. This collaboration shows an example of how artists can create richer and more diverse works.

AI-created art has critical and supportive views. Critics raise concerns about authenticity, ethics, and the negative impact on human artists, while supporters consider AI as a powerful tool to democratize art, enhance human creativity, and offer new possibilities in artistic creation. It is necessary to have ongoing discussion of how to embrace AI in the arts and explore how to use AI in art effectively by overcoming issues in its use.

4. Implication of AI in Future

The use of AI in art is reshaping creative processes and artworks as it shows new ways of creating artworks. At the same time, it raises concerns on ethics and practices in integrating it into art. AI's potential in art is found in augmenting human creativity, preserving cultural heritage, and generating new artworks. However, considerations and robust guidelines are mandatory in using AI in art to solve the challenges that have been pointed out.

AI blurs the lines between human- and machine-created art, which makes people doubt of the authorship and originality of AI-generated artworks. It is also regarded that AI-generated artworks lack the emotional aspects found in human-created art and intentionality. AI needs to be trained on existing artworks. If it is not trained appropriately, biases can occur, which can hinder diverse and cultural representations in AI-generated art. The use of copyrighted artwork to train AI models without the permission or authorization can cause legal disputes and increase ethical concerns about the use of such data. Therefore, to enjoy the benefits of AI in art while minimizing its drawbacks, appropriate guidelines and policies are necessary from the following perspectives (Elgammal, et al. 2017; Crawford and Paglen, 2019).

1. Transparency of AI's involvement in the creation process to inform audiences about the how based on what AI generates artworks
2. Ethical training to train AI on various data to mitigate biases
3. Consent of artists in training AI using existing artworks
4. Copyright and fair use under legal frameworks around the use of copyrighted material in AI training
5. Human-AI collaboration to encourage artists to use AI as a tool to augment their creativity and create new artistic expression with their creation
6. Education about AI for understanding of its implications and limitation in its use

AI can be used in art based on its transformative potential, which can provide a new way to find or enhance creativity and innovation. However, challenges must be addressed, which requires strict but agreed guidelines and policies by artists, legal experts, and audiences. Then, the transparency, ethical training, robust intellectual property frameworks, and human-AI collaboration can be assured to mitigate the risks in using AI in art. A balanced approach between technological advancement and artistic integrity is necessary to establish.

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