

Interdisciplinary Research on Art in the AI Era—Trends, Methods and Practices

Qinhua Yang

Shanghai Academy of Fine Arts, Shanghai University, Shanghai 200444, China.

shinkasuru11@outlook.jp

Abstract: This review article examines the fascinating academic field of art and artificial intelligence (AI) and seeks to determine the current state of research in this area. Firstly, our proposal is to prioritise the definition of the primary directions and tendencies. Secondly, we suggest comparing various approaches to the research. Lastly, we want to provide concrete instances of how these directions and tendencies interact in real-life situations. **Method:** We conducted a deep investigation into the fields of artificial intelligence and art, focusing on various approaches to extensive research, categorization of studies, industry analysis, and practical demonstrations. We limited our research to primary and secondary sources for the collection of both qualitative and quantitative data, with a particular emphasis on collaborations between artists and AI researchers. The main internal barrier was methodological, as we encountered some challenges during the process, but we were able to devise strategies to overcome them. **Results:** Here, the study singles out several important trends related to the use of artificial intelligence in art. The study highlights the emergence of AI art, the integration of machine learning into art-related processes, and the fusion of traditional and digital art forms. The amalgamation of traditional and digital art forms is a common practice. In aesthetic production, AI tools and software can be considered essential elements of contemporary artistic procedures. The outcomes also stress the need to focus on interdisciplinary collaboration with regards to educational initiatives, training sessions, and future business developments. Some of the most important points of reflection for this discussion are the ethical and philosophical questions about the author and ownership rights to AI-styled art. **Conclusion:** Incorporating artificial intelligence into the arts implies that such a discipline is a plural and evolving field of research, embracing various branches of knowledge. Given that ethical issues serve as a platform for ongoing discussions among artists, AI researchers, and politicians, this analysis emphasizes the need for future investigations to delve into emerging technologies, incorporate additional methodologies, and employ innovative approaches to fortify the connection between art and artificial intelligence.

Keywords: Traditional and Digital Art Fusion; Contemporary Artistic Procedures; Interdisciplinary Collaboration; Educational Initiatives; Training Sessions; Business Developments in AI Art; Ethical Questions in AI Art

1. INTRODUCTION

Art and artificial intelligence are merging, thereby creating an active interdisciplinary scientific area that relates the relationship between creative

work, techniques, and cognition. Artificial Intelligence (AI) has a significant impact on art, spanning across various areas such as the analysis of artworks, the creation of new artworks, and even challenging the fundamental aspects of creativity in art (Cetinic & She, 2022; Papia et al., 2023; Samo & Highhouse, 2023). New studies show that it is possible for AI to produce art that is indistinguishable from art works produced by humans and this gave rise to discussions as to who owns art and the concept of ownership. However, where people have not been able to distinguish between AI and artworks by different artists, there could be prejudice against it (Tigre Moura et al., 2023). This bias highlights the persistent societal prejudices towards AI and its role in diverse creative domains. In addition, the research has revealed that the integration of artificial intelligence in the art-making process improves how originality is perceived and how artwork is assessed (Hung et al., 2022). It turns out that while implementing AI it is possible to demonstrate that there are rather clear tendencies towards the increase or decrease of the quality and level of invention of the artwork depending on the high or low level of AI contribution in the further cumulative progression of the artwork. This explains the interaction between AI and artistic processes by presenting not only augmentation of the procedures but also opening up questions about following the traditional norms. With the help of Generative Adversarial Networks (GANs), that is the AI technology, the sphere of prospective painting has been promoted. The present study looks at how art and AI are interacting as a new framework that could change different ideas about creativity and how art is represented in the context of new technologies and how people and computers work together looks at how art and AI are interacting as a new framework that could change different ideas about creativity and how art is represented in the context of new technologies and how people and computers work (Figure 1) .



Figure 1: An AI-Generated Artwork that Blends Conventional and Digital Art Beautifully

1.1 Importance of Studying Art in the AI Era

Therefore, within the field of artificial intelligence, the study of art is of utmost importance. So, we should view creative computing as a valid approach to presenting creative work to society and interacting with the public. This art form goes beyond mere duplication and instead delves into innovative methods of representing data structures. It is captivating to examine and capture many facets of society's subconsciousness (Kalpokas, 2023). Furthermore, it serves as a highly effective method for augmenting individuals' comprehension of AI, connecting technical solutions with control systems, and enabling non-experts to acquire knowledge through hands-on experiences (Wingström et al., 2023). The advent of AI-art represents a revolutionary novelty in the framework of artistic freedom, as it focuses on the notion of AI-art creation and the integration of internal assessment tools for AI as well as external aesthetic appraisals. Nevertheless, the scenario highlights the significant reality that, as AI enables new opportunities for creative expression, it also raises significant enquiries regarding authorship, significance, and ethics. It is important to acknowledge that these enquiries not only accompany but also propel ongoing critical engagement in this specific and rapidly advancing domain. AI image generators pose significant problems because they fundamentally challenge traditional notions of creation and authorship. These tools suggest that AI has the potential to create art through poetic performances involving both humans and non-humans. This raises numerous fascinating questions about the fundamental nature of art, the artist's standing, and the potential for art production collaboration with artificial intelligence. Analyzing art in the context of AI means going beyond the discussion about the new type of art that AI would create. In this article, we turned our attention to the ways in which artificial intelligence is changing the notion of creativity, the concept of technology, and art. In the twenty-first century, it is critical to know the meaning of this statement when venturing into art and its dynamics.

1.2 Objectives of the Review Paper

Examining the academic paper "Interdisciplinary Research on Art in the AI Era: 'New Trends, Methods, and Practices'" reveals the influence of artificial intelligence on art study and practice." The major concern of this review is the shift in the creation and generating of new works of art, via artificial intelligence, and aesthetes' attitudes towards such works. Figure 2 reveals that a significant majority of aesthetes (65%) continue to prefer art created by humans, possibly because of their familiarity or emotional acumen with such works. However, there is a discernible trend towards a

higher level of favourable reception of AI-generated art. This is evidenced by the fact that 10% of aesthetes expressed support for it, indicating a genuine interest in AI as a creative drive. Specifically, a mere 75% of aesthetes express their unequivocal viewpoint regarding AI art, whereas 25% of the respondents acknowledge the possibility of overinterpretation or negative comments about AI art, recognising the potential advantages and disadvantages. Accordingly, the paper focuses on two main lines of investigation. The study explores the intentional incorporation of algorithms and data by artists' organizations into their expanding artistic practices, emphasising the role of AI in exhibitions as a consequence of these artists' endeavours to promote innovation. Also, as a part of this research, new concepts regarding the definition of creativity in the sphere of human- AI communication are identified. Beginning at that Crossing this threshold reinforces the idea mentioned throughout this worldview that artists, scientists, and AI are all involved in a process of discovery and creativity. This paper describes and analyzes a historical and contemporary art piece specifying the differences between forms and AI art, creating a comparison between AI art and art created by people, understanding representation and color preference by mathematical analysis (Kalpokas, 2023). The purpose of this comparison is to build a fundamental comprehension of the correlation between artificial intelligence (AI) and creativity. In addition, the study explores consequences of the findings for spectators' acceptance of AI-artwork and examines certain parameters, including novelty and the ability to touch, to assess the response to the artwork created by AI among the audience (Papia et al., 2023). This paper also contains brief discussion regarding the social and ethical issues associated with the AI in art such as copyright issues, authenticity, the issue of bias in the datasets used within the AI. The author wishes, by dissecting these complex elements, to raise people's knowledge regarding AI in art and its complex interconnection with other aspects of society.

2. BRIEF OVERVIEW OF THE EVOLUTION OF INTERDISCIPLINARY RESEARCH IN ART AND TECHNOLOGY

Art and AI, being an inter-disciplinary field of study, have undergone change over the years, with more concepts being oriented towards the integration of various disciplines. This has led to apparent solutions such as, interactive systems like, Smart phones, Video games and laptops which form evidence of Interdisciplinary research and its worthiness (Ke, 2023).

The advancement of what is commonly known as Augmented Reality (AR) technology has extended this trend, where artists in conjunction with IT specialists' development the more popularised AR Art with much vigour and virtue of merging artistry with technology (López-del-Rincón, 2016). Cross-disciplinary integration does not only apply to the world of product creating since PDF is not limited to it.

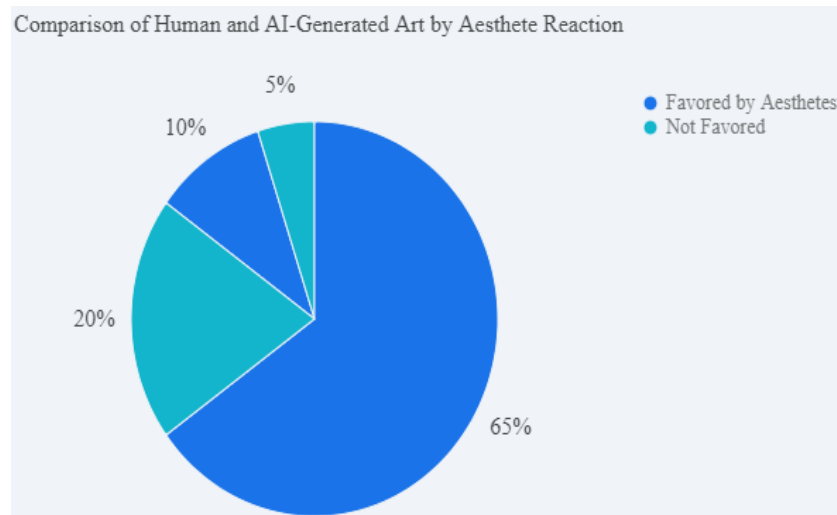


Figure 2: Comparison of Human and AI-Generated Art by Aesthete Reaction

As the world becomes more interconnected it also becomes more technological, combining the knowledge of two or more fields is vital for the improvement of technology and the world itself (Zhang & Candy, 2007). Humanities and science play a crucial role in advancing culture, supporting the application of cultural solutions to address various societal issues, and enhancing the stimulation and sociopolitical influences of knowledge (Legrady, 2006).

Thus, in the context of art, one can observe that technology is a major force that allows new possibilities in art and extends beyond from the scope of this paper. For instance, artificial intelligence is being applied in generating artwork whereby artists utilize artificial intelligence in producing artwork that would otherwise require the artist to achieve individually through their hand. Furthermore, elements such as virtual and augmented reality are transforming artistic representations into new, impressive forms of interactive art. However, the use of technology in arts can also cause debate in the realms of morality and existentialism. For example, who holds the right to authorship for artwork produced by an AI? What can it mean to have an artificial device replicate art and make it impossible tell the difference between artificially produced art and artwork done by human beings? All of these questions are still debatable and to answer them more consolidated interdisciplinary work should be done (Figure 3).

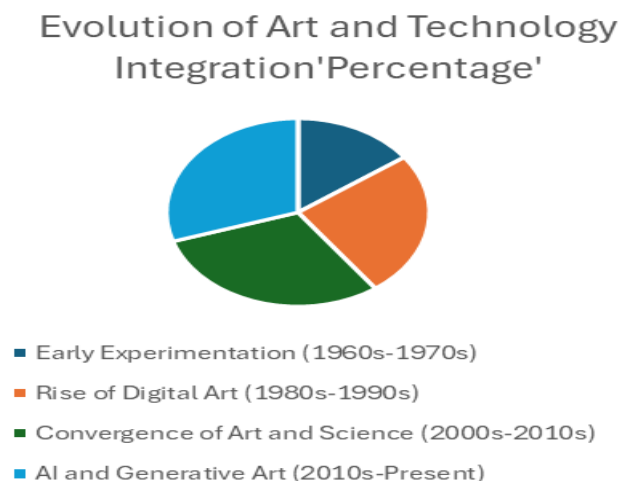


Figure 3: Evolution of Art and Technology Integration

3. KEY MILESTONES IN THE INTEGRATION OF AI IN ART

The art world has consistently been a hub of groundbreaking ideas, and the incorporation of AI is no different. The interaction between human creativity and technological expertise is akin to a dynamic and lively dance, with each advancement uncovering fresh opportunities. Imagine an artist who not only uses brushes but also works in partnership with algorithms to create visuals that surpass the boundaries of human imagination. This is the current state of affairs, made possible by AI-driven technologies such as DALL-E, which can transform your most imaginative concepts into reality based on written descriptions (Caramiaux & Fdili Alaoui, 2022). Artists are currently embarking on expeditions into unknown domains, employing Generative Adversarial Networks (GANs) to broaden their creative repertoire and question conventional concepts of artistic representation. It is akin to introducing an entirely novel aspect to the canvas, where hues and forms intermingle in unparalleled ways (Sabetsarvestani et al., 2019). However, the intrigue does not end there. The AI's ability to imitate human artistry has sparked debates about the essence of art and the significance of emotional attachment in the act of creation (Samo & Highhouse, 2023). Can an emotionless machine genuinely encapsulate the fundamental nature of human experience? AI is revolutionising the way humans analyse and evaluate art, extending its impact beyond the act of production. Deep neural networks serve as a kind of augmented vision which helps to see multiple layers within paintings and comprehend the secrets which were intertwined into the work and left between the lines. This is the advantage of using genuine analysis since it unveils specific features of a piece, aspects that would have otherwise gone

unnoticed. This is an ongoing creative experiment, which blurs boundaries and tests possibilities of artmaking as well as binary of human vs. non-human. This statement is concrete evidence to the fact that as humans, we never cease to create and to go further in our discovery.

4. CURRENT TRENDS IN AI AND ART

Contemporary generative AI systems such as DALL-E2, Midjourney, and Stable Diffusion are popularising more art creation since users can create complex and realistic artwork from natural language descriptions (Cousins, 2023; Zylinska, 2020). This lays the basis of the current trends that are attesting to the fact that AI and art are two sides of the same coin. Consequently, the fields began to merge, and now there is a lot of discussion about artificial intelligence in design, which applies artificial intelligence actively in the art design field to improve efficiency and expand the scope of the application (Zhou, 2022). Artificial intelligence has attracted the attention of many people because of its possibilities to be applied to painting. By automating some of the processes involved in traditional painting and creating new kinds of art that push the boundaries of what is considered art, it will transform the production of digital art (Liu, 2023). As per these critics, innate AI is incapable of doing justice to the superior kind of knowledge and deep feelings brought to life by artists (Shi, 2023). Some have contended that use of AI is likely to bring great positive impact on artists by enhancing one's creativeness or expanding the outlet and media through which creative endeavors can be made. Therefore, this ongoing discussion has revealed the importance of the continued investigation of how AI could become not only a tool in art making but also an artist's collaborative partner.

5. OVERVIEW OF CONTEMPORARY TRENDS IN AI AND ART

At present, the incorporation of artificial intelligence into Art has led to the establishment of a decentralized system (Browne, 2022). This phenomenon has also resulted in a fusion of the boundaries of innovation within creative movements. In the changing environment, artists and scientists are collaborating with AI on an equitable basis, utilising it as a partner, a creative tool, or a source of inspiration. This new art genre utilises coding and programming as a means of creating aesthetic experiences. In

this genre, artists interact with artificial intelligence and embrace the potential of the processes from which they originate (Wingström et al., 2023). The interdependence between artists and AI emerges from the active involvement of artists in the outputs generated by AI, rather than only utilising AI as a tool. This goes beyond the notion of artists delegating or assimilating artificial intelligence skills. There are two main components to integrating artificial intelligence (AI) with art. Firstly, we use AI's advanced technology to define digital art galleries. Secondly, we use AI's results as creative input to create new and refined art pieces (Cetinic & She, 2022). This discourse highlights the complex and diverse approaches to incorporating AI into art, encompassing both scholarly research and artistic means. Despite the fact that the latest advancements in AI in art have sparked more curiosity about future developments than past achievements, there are arguments about what an "AI artist" is and how the market separates them from the art they create. These arguments have led to questions about ownership, authorship, and the meaning of art made by machines. Even so, people are still excited about AI's untapped potential in art. It could lead to new ways of making and discovering art, as well as help us understand what creativity means in today's digital world.

6. AI-GENERATED ART AND ITS IMPACT ON TRADITIONAL ART FORMS

The application of generative AI stimulates this new and dynamic way of creating and producing art, enabling what is now known as AI-art. As a result, this new paradigm of artistic expression is very useful in providing new and often serendipitous means of producing unique forms of visual art (Kalpokas, 2023). However, this new and growing discipline has sparked animated discussions about the admissibility of AI-generated artworks and their potential effects on the art field. People wonder if the artist is dead now that so many works can be generated by AI (Hutson & Harper-Nichols, 2023). However, past experiences, such as the emergence of photographs, demonstrate that technological advancements do not lead to the demise of art, but rather foster the growth of students' creative activities (Hutson & Lang, 2023). Therefore, speakers underlined that the applications of AI in art and design are not about substitution but transformation, which requires artists to consider the ways in which they create and perform differently. AI art has also opened up new opportunities for artists and the commercialization of artwork production.

Non-fungible tokens, exclusive digital assets with blockchain IDs, are gaining popularity as a new generation of art, ensuring the economic utility of this innovative form of art remains intact (Epstein et al., 2023). Such a development necessitates human interference and direction in AI art, since artists and curators are critical in the selection, fine-tuning, and contextualisation of AI-created works. Thus, while generative AI is often considered in its antagonistic relation to traditional art, it is better to conceive of it as a new set of tools with their own specific possibilities and impossibilities. This movement is changing the parameters of aesthetics, calling into question cultural prejudices, and provoking multifaceted legal-ethical dilemmas about authors' rights and ownership. Not only does AI art provoke art criticism, but it also raises questions about innovation and employment, the role of artificial intelligence in the contemporary creative industry, and the role of art in postindustrial society. Thus, the use of AI in art is a new perspective that helps one look at human creativity and its connection with the technological environment. As AI grows from strength to strength, it is already inevitable that it will gradually influence art's production, appreciation, and asset value.

6.1 The Role of Machine Learning and Neural Networks in Art Creation

AI absorption matches the ever-evolving progressive art scene. Expanding with every movement, it mimics a dynamic interaction of people's creativity, engineering, and technology. Imagine a painter who works with computers to produce amazing visuals in addition to brushes for creating masterpieces (Brook, 2023). Artificial intelligence, such as DALL-E, has enabled the wonders of art generation, making your dream creations a reality through text descriptions. As pioneers, artists are pushing new frontiers and adding Generative Adversarial Networks (GANs) to their toolkit, providing a fresh perspective on the purpose and meaning of art. They provide the previously unthinkable degree of primary colours and shapes, thereby augmenting the already-seen whole picture (Dobbs & Ras, 2022). Still, the wonder never stops. As artificial intelligence has advanced to the point that it can replicate human creativity just as well, if not better, people are increasingly discussing what defines art and the meaning of affection in it (Dyer, 2022). Someone is narrating a narrative, but might a machine devoid of human consciousness be able to tell the same one? Furthermore, AI's current influence on artistic viewpoints and interpretation techniques is important. Deep neural networks open a new dimension to these masterpieces, like x-ray vision. They seem to grant us a different viewpoint. They appear to be providing us with a chance to

understand the fundamentals of artistic expression in a manner that would assist us. Incorporating an artificial intelligence algorithm into the process enables us to learn, experiment, and critically examine the concept of art and the artist's role. Forever highlights the human search for innovation and world knowledge.

6.2 Prominent Projects and Initiatives

In terms of artificial intelligence-produced art, there are some basic concepts and works that best demonstrate the ideal fusion of science and art. OpenAI's DALL-E2, named in Salvador Dal's honour, is a deep learning-based model that creates new images from textual descriptions, thereby showcasing one of the opportunities of computational art. Wang, Shen, and Lim's Repromoted is a similar study that looks at an automatic system that changes text descriptions based on prompts to make ineffective AI parts work better (Vanhaecke, 2023). This enhances the visibility of negative emotions and demonstrates advancements in establishing emotional context (Wang et al., 2023). Sofia Crespo and Feileacan McCormick are two artists who utilise artificial intelligence in their generative artworks, attempting to address various issues in natural ecology and biology to create art that is truly unforgettable. Kalpokas also explores the impact Kalpokas also investigates the impact of AI art, not only through mechanical replication, but also by utilizing data patterns to provide insights into societal value and exhibition within the context of technological growth and distraction (Crespo & McCormick, 2022). Kalpokas uses GANs to replace one image set with another, as well as psychological experiments to assess the differences between artworks and genres, thereby validating the use of artificial intelligence as a research tool in art.

6.2.1 Prominent Projects and Initiatives

DALL-E2 by OpenAI Overview: DALL-E2 is an AI programme by OpenAI which generates images based on the textual descriptions. This technique has been recognized by many art lovers due to the depth and creativity of the artwork produced by this technique. **Impact:** DALL-E2 exhibit AI in aesthetics to improve imaginative thinking in art and business ventures and has elicited hope and debate on embracing AI in art.

Midjourney Overview: Midjourney is an independent research venture that shows an AI program that generates images based on textual prompts, like DALL-E2. **Impact:** The detailing on the creation of the presentation

makes the platform more attractive to artists and designers due to the unique interface and the quality of the work done. It raised awareness regarding the availability of the application of AI in creative industries.

AI Art Lab by Google Arts & Culture Overview: The application called Google Arts & Culture's AI Art Lab is dedicated to the relation between machine learning and art and aims to provide artists with tools to work with AI.

Impact: It has emerged into a great number of cross overs and practice, which generated tremendous of art working and new approaches of creative search. These are among some projects and initiatives illustrating various stations of how AI is gradually entering into the sphere of art and how artists, artworks, and AI can interact with each other. They speak to the possible revolution that is contained in AI technology in transforming the frontiers of artwork creation.

7. METHODS IN INTERDISCIPLINARY RESEARCH

The qualitative theme investigation of selected multidisciplinary works on artificial intelligence and art reveals the variety of methodological techniques employed by authors exploring this largely unexplored field. Experts in artificial intelligence are investigating the primary differentiating elements of several classifiers that may identify works produced by humans and AI algorithms (Papia et al., 2023). This not only clarifies for academics the value of the unique characteristics of AI-art, but also raises questions about provenance and authorship in relation to the art market. Furthermore, new elements like Generative Adversary Networks (GANs) have given fresh chances to the variations in the artistic and genre of the artworks. By applying GANs to various data sets, it became possible to generate artworks that reflect specific styles or times, thereby enabling the analysis of the patterns defining diverse artistic trends (Samo & Highhouse, 2023). It not only helps art historical research, but also gives designers and artists new approaches to thinking and answers to design issues. Artificial intelligence not only serves analytical purposes, but it also assists in the identification of multidisciplinary research. The IRD-BERT model, which is based on neural networks, simulates domain knowledge and gives us a way to figure out how the author's keywords don't make sense with each other when it comes to multidisciplinary research (Nordström et al., 2023). This approach has the potential to facilitate effective collaboration among various disciplines and reduce the time required for searching for

multidisciplinary research papers in fields such as deep learning. Apart from these illustrations, the changing synergy of artificial intelligence with art has influenced fresh methods and strategies of multidisciplinary cooperation to solve problems in this sector of development. Artificial intelligence, in conjunction with AI, is being investigated for its relevance to art curation, art preservation, and new art production. As artificial intelligence is deployed, its integration into art will become more complex, leading to further breakthroughs in conceptual innovation, aesthetic appeal, and the role of technology in art. This study goes beyond the boundaries of the disciplines that comprise the body of knowledge already in use; hence, the research will be able to borrow significantly from other disciplines and fields; an interdisciplinary dialogue between art and technology will continue to bloom, and it is only good for both fields.

7.1 Comparative Analysis of Traditional vs. AI-Driven Artistic Techniques

Traditional artistic methods and AI-driven art differ greatly in their creation and reception. While conventional art relies on human emotion and creativity (Kalpokas, 2023), artificial intelligence-generated art reflects society's conditions and technological changes by identifying and creatively displaying data patterns (Samo & Highhouse, 2023). Studies show that although individuals find it difficult to distinguish between human and artificial intelligence art, they generally like human-created art because of the good emotions it arouses (Papia et al., 2023). Furthermore, while examining variations in creativity in relation to human counterparts, it is equally crucial to observe the separate phases involved in animal art production depicted in the figure. Artificial intelligence often fails to accurately replicate the unique painting techniques of human painters. The individual possesses mastery of the processes of altering hue and exhibits a well-defined physical form. Artificial intelligence art, unlike human art, typically falls short of accurately depicting the various styles and trends of painting (Sun et al., 2022). This is primarily due to its inability to accurately shape and control color changes, as mentioned in the literature. Nevertheless, the development of AI solutions has allowed for some progress in the art generation (Zhou, 2022).

The fundamental distinction lies in the underlying basis of creation: the emotional connection to traditional human art versus the progress made in information and communication technology and artificial intelligence developments.

7.2 Case Studies Exemplifying Successful Interdisciplinary Research

It was found that the integration of modern art with artificial intelligence is a new study area that demonstrates the possibilities for additional development and research via numerous successful case studies.

The Next Rembrandt Project: This initiative involved training artificial intelligence on a specific artwork by the renowned 17th-century Dutch painter Rembrandt. Using the test piece as a reference, AI then produced a new artwork that emulated Rembrandt's distinctive style. The outcome of using such an approach remained true to the master's style and accurately reflected the composition (Figure 4).



Figure 4: AI Art Produced through Rembrandt's Painting style

Deep Dream: Deep Dream is program in computer vision that has been designed based on neural network developed by Google. Deep dream is mostly applied by artists to produce fanciful and dream-like images from normal images or videos(Figure 5).

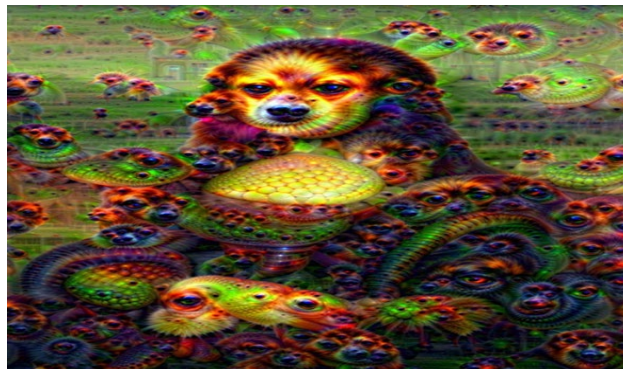


Figure 5: The Mona Lisa with Deep Dream effect using VGG16 network trained on ImageNet

Refik Anadol's immersive installations: Currently, Refik Anadol is an internationally recognized media artist contributing to such large format immersive installations as where AI and the data create the art. The man's work is usually involved in social theme, more specifically human's interaction with technology and the advent of artificial intelligence allowing for new forms of art (Figure 6).



Figure 6: Human's Interaction with Technology and the Advent of Artificial Intelligence

These are just a few of the countless examples of great case studies of arts and interdisciplinary studies with artificial intelligence. And as the AI technology advances further, we will be witnessing new and exciting examples and kinds of interactions that artists and AI Engineers have come up with.

8. CONCLUSION

Now in all fields companies used AI. The integration of AI with art technology is one area that is growing. This review paper gathers the latest trends, new ideas, and innovative methods in this constantly evolving field. The paper explores how AI influences and enhances various forms of art, their creation processes, and how people perceive them. Paper's analysis leads to the conclusion that AI is not only a tool that artists can use to make art but also a co-creator that can come up with ideas for art, thereby constantly broadening the human mind. AI technology has facilitated the creation of new types of art, methods, and media. This has made the world of modern experimental art truly diverse. Similarly, AI's ability to understand huge amounts of data has changed the job of an art historian, art curator, or reviewer. It has also shown how art has changed over time and affected society. Working together between art and science, as well as other fields, is very important in today's world. These kinds of partnerships have made it possible to make complex AI software that can imitate human imagination while also helping artists make interactive works of art. However, these kinds of accomplishments raise profound and significant moral and philosophical questions, such as who is responsible for the creation and originality of a work of art, and whether AI art is following the trend of human achievements. Machine learning, neural networks,

generative adversarial networks (GANs), and natural language processing (NLP) are some of the AI-based tools used in art studies and practices. The implementation of new ideas through old methods raises two questions about the definition of art and creation in the context of AI. As we move forward, AI will continue to mix with art in an infinite number of ways. New concepts like quantum computing and extended reality (XR) will bring even more new ideas to the field. Many researchers and professionals who are associated with new technologies often struggle with the need to both study humanism and advance new technologies. This is one of their greatest responsibilities to the business in terms of ethical conduct. To sum up, the interaction between AI and art means a shift, which opens a lot of possibilities and ways for further evolution. Thus, given the fact that this field is constantly evolving, members of various professions will have to consult with each other in order to ensure that incorporating AI into art enriches the human experience and does not detract from it. For the new forms of art, created by artificial intelligence, on the one hand, and for the ethical standards which should regulate the use of artificial creativity, on the other hand, the following will be suggested. This way, we can utilize such opportunities for altering the panorama of cultural visual environment and study the concept of creativity in detail.

References

- Brook, T. (2023). music, Art, machine learning, and Standardization. *Leonardo*, 56(1), 81-86.
- Browne, K. (2022). Who (or what) is an AI Artist? *Leonardo*, 55(2), 130-134.
- Caramiaux, B., & Fdili Alaoui, S. (2022). " Explorers of Unknown Planets" Practices and Politics of Artificial Intelligence in Visual Arts. *Proceedings of the ACM on Human-Computer Interaction*, 6(CSCW2), 1-24.
- Cetinic, E., & She, J. (2022). Understanding and creating art with AI: Review and outlook. *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)*, 18(2), 1-22.
- Cousins, S. (2023). The rapid rise of AI art. *Engineering & Technology*, 18(2), 20-25.
- Crespo, S., & McCormick, F. (2022). Augmenting Digital Nature: Generative Art as a Constructive Feedback Loop. *Architectural Design*, 92(3), 54-59.
- Dobbs, T., & Ras, Z. (2022). On art authentication and the Rijksmuseum challenge: A residual neural network approach. *Expert Systems with Applications*, 200, 116933.
- Dyer, M. (2022). Neural Synthesis as a Methodology for Art-Anthropology in Contemporary Music. *Organised Sound*, 27(2), 219-226.
- Epstein, Z., Hertzmann, A., Herman, L., Mahari, R., Frank, M. R., Groh, M., Schroeder, H., Smith, A., Akten, M., & Fjeld, J. (2023). Art and the science of generative AI: A deeper dive. *arXiv preprint arXiv:2306.04141*.

- Hung, M. C., Nakatsu, R., Tosa, N., & Kusumi, T. (2022). Learning of art style using AI and its evaluation based on psychological experiments. *International Journal of Arts and Technology*, 14(3), 171-191.
- Hutson, J., & Harper-Nichols, M. (2023). Generative AI and algorithmic art: disrupting the framing of meaning and rethinking the subject-object dilemma. *Global Journal of Computer Science and Technology*, 23(D1), 55-61.
- Hutson, J., & Lang, M. (2023). Content creation or interpolation: AI generative digital art in the classroom. *Metaverse*, 4(1), 13.
- Kalpokas, I. (2023). Work of art in the Age of Its AI Reproduction. *Philosophy & Social Criticism*, 01914537231184490.
- Ke, Q. (2023). Interdisciplinary research and technological impact: evidence from biomedicine. *Scientometrics*, 128(4), 2035-2077.
- Legrady, G. (2006). Perspectives on collaborative research and education in media arts. *Leonardo*, 39(3), 215-218.
- Liu, M. (2023). Overview of Artificial Intelligence Painting Development and Some Related Model Application. SHS Web of Conferences,
- López-del-Rincón, D. (2016). Arte, biología y tecnología. Relaciones interdisciplinarias en el laboratorio científico. *Arte, Individuo y Sociedad*, 28(2), 235-252.
- Nordström, P., Lundman, R., & Hautala, J. (2023). Evolving Coagency between Artists and AI in the Spatial Cocreative Process of Artmaking. *Annals of the American Association of Geographers*, 113(9), 2203-2218.
- Papia, E.-M., Kondi, A., & Constantoudis, V. (2023). Entropy and complexity analysis of AI-generated and human-made paintings. *Chaos, Solitons & Fractals*, 170, 113385.
- Sabetsarvestani, Z., Sober, B., Higgitt, C., Daubechies, I., & Rodrigues, M. R. (2019). Artificial intelligence for art investigation: Meeting the challenge of separating x-ray images of the Ghent Altarpiece. *Science advances*, 5(8), eaaw7416.
- Samo, A., & Highhouse, S. (2023). Artificial intelligence and art: Identifying the aesthetic judgment factors that distinguish human-and machine-generated artwork. *Psychology of Aesthetics, Creativity, and the Arts*.
- Shi, J. (2023). Artificial Intelligence for Art Creation with Image Style. *Highlights in Science, Engineering and Technology*, 44, 67-74.
- Sun, Y., Yang, C.-H., Lyu, Y., & Lin, R. (2022). From pigments to pixels: a comparison of human and AI painting. *Applied Sciences*, 12(8), 3724.
- Tigre Moura, F., Castrucci, C., & Hindley, C. (2023). Artificial intelligence creates art? An experimental investigation of value and creativity perceptions. *The Journal of Creative Behavior*, 57(4), 534-549.
- Vanhaecke, L. (2023). *WHERE ARTIFICIAL INTELLIGENCE MEETS ART* [Ghent University].
- Wang, Y., Shen, S., & Lim, B. Y. (2023). Reprompt: Automatic prompt editing to refine ai-generative art towards precise expressions. Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems,
- Wingström, R., Hautala, J., & Lundman, R. (2023). Redefining creativity in the era of AI? Perspectives of computer scientists and new media artists. *Creativity Research Journal*, 1-17.

- Zhang, Y., & Candy, L. (2007). A communicative behaviour analysis of art-technology collaboration. Human Interface and the Management of Information. Interacting in Information Environments: Symposium on Human Interface 2007, Held as Part of HCI International 2007, Beijing, China, July 22-27, 2007, Proceedings, Part II,
- Zhou, P. (2022). Research on the application of artificial intelligence in art design. International Conference on Computer, Artificial Intelligence, and Control Engineering (CAICE 2022),
- Zylinska, J. (2020). *AI art: machine visions and warped dreams*. Open Humanities Press.