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The Effects of AI Image Synthesis on Graphic Design

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The Effects of AI Image Synthesis on Graphic Design

by

Ji Ren

A thesis/ project submitted in conformity

with the requirements for the

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Abstract

From 1763 when Thomas Bayes developed a framework to infer event probabilities, to the end of 2022 when the world-renowned AI research laboratory Open AI launched Chat GPT, a language model based on AI technology, statistical computing-based AI has revolutionized human life. AI image synthesis can simulate the processes and methods of human painting through machine learning, deep learning, and other methods, thereby generating high-fidelity images. There is growing concern about how AI image synthesis will affect the art world as it advances. The art market could be reimaged, authorship and creativity concepts challenged, and traditional artistic practices disrupted by this technology. During this process, AI image synthesis can not only improve the efficiency and accuracy of drawing but also reduce costs and time, thereby influencing the market pattern of the graphic design industry. As a new art category, AI art is undergoing an evolution from imitating traditional art media to being an independent art medium. Provide insights into the opportunities and challenges presented by this technology by examining the effects of AI image synthesis. Artists can learn more about how AI can help or hurt them in their creative process and think about new ways to work with AI systems. In addition, this study will contribute to a broader discussion of AI ethics and copyright concerns in the art industry.

Key Word: AI image synthesis, Graphic Design, Originality, Ethicality, Art Market.

ILLUSTRATIONS

Figure 1

<https://zhuanlan.zhihu.com/p/638042008>

Figure 2 - Figure 11

Made by Author

Table of Contents

Abstract	i
1. Chapter 1 Introduction.....	1
1.1 Background	1
1.2 Literature Review	6
1.3 Organization of the Thesis	11
2. Chapter 2 The originality problem of the AI-powered image synthesis technology	13
2.1 The relationship between human designers and AI synthesis technology in the creation process	15
2.2 How to view the originality problem in AI image synthesis technology	16
3. Chapter 3 The ethicality problem of the AI-powered image synthesis technology	18
3.1 How to distinguish AI synthesized Image	21
3.2 Countermeasures for AI Ethicality Problem	23
4. Chapter 4 The technological dependency problem of the AI-powered image synthesis technology	25
4.1 Conveniences brought by AI-powered image synthesis technology to designers	26
4.2 How designers should face AI technology.....	28
5. Chapter 5 How AI Image Synthesis Technology affects the sales market of graphic design and artistic products.....	30
5.1 Response to Interview Questions	33
5.2 Data Analysis	43
6. Chapter 6 Conclusion	54
7. Bibliography.....	56

1. Chapter 1 Introduction

1.1 Background

The development of artificial intelligence in the art world can be traced back to the early tests and joint efforts among specialists and PC researchers. During the 1960s and 1970s, spearheading specialists, for example, Frieder Nake and Harold Cohen started investigating the capability of PCs to produce creative pictures and organizations. During this period, artificial intelligence frameworks were somewhat restricted in their abilities, depending on rule-based calculations to create straightforward mathematical examples and theoretical pictures. These early analyses established the groundwork for additional headways in simulated intelligence picture amalgamation, making way for additional mind-boggling and modern strategies to arise¹.

As processing power expanded and AI calculations improved, the field of computer-based intelligence picture combination encountered a huge lift. Profound learning calculations, especially Convolutional Brain Organizations (CNNs) and Generative Ill-disposed Organizations (GANs) changed how computer-based intelligence frameworks could comprehend and create visual substance. These calculations permitted PCs to gain from huge measures of information, including existing works of art, and produce new pictures that displayed expressive likenesses to the preparation information. The utilization of GANs specifically has been a unique advantage in artificial intelligence picture blends. GANs comprise two brain organizations, a generator, and a discriminator,

¹ Andreas Kaplan and Michael Haenlein, "Rulers of the World, Unite! The Challenges and Opportunities of Artificial Intelligence," *Business Horizons* 63, no. 1 (2020): 37–50, <https://doi.org/10.1016/j.bushor.2019.09.003>.

that work pair to create reasonable pictures. The generator network figures out how to produce pictures that fool the discriminator into accepting they are genuine, while the discriminator network figures out how to recognize genuine and created pictures. This antagonistic preparation process brings about the generator network ceaselessly working on its capacity to make outwardly persuading and tastefully satisfying pictures².

The headways in artificial intelligence picture amalgamation methods have empowered PCs to produce fine arts that have attributes that look like those made by human craftsmen. Artificial intelligence frameworks can now imitate different creative styles, copy explicit brush strokes, and even produce completely recent trends and structures. This has opened up new roads for imaginative articulation, as craftsmen can team up with man-made intelligence frameworks to improve their inventive strategy or use man-made intelligence as a device to investigate new creative domains. Moreover, the advancement of man-made intelligence in the art world has affected the production of art as well as how art is capable and consumed. Man-made intelligence-fueled frameworks and applications have been created to break down and decipher art, give proposals to watchers, and work with intuitive and vivid art encounters. These innovations upgrade crowd commitment, give customized art suggestions, and give better approaches to appreciating and figuring out fine arts³.

The field of computer-generated art has been transformed by advancements in AI image synthesis techniques, which have made it possible for computers to produce images

² Zichun Xu, "Human Judges in the Era of Artificial Intelligence: Challenges and Opportunities," *Applied Artificial Intelligence* 36, no. 1 (2021), <https://doi.org/10.1080/08839514.2021.2013652>.

³ Caiming Zhang and Yang Lu, "Study on Artificial Intelligence: The State of the Art and Future Prospects," *Journal of Industrial Information Integration* 23 (2021): 100224, <https://doi.org/10.1016/j.jii.2021.100224>.

that are both visually stunning and artistically significant. The application of generative models like Generative Adversarial Networks (GANs) and the development of deep learning algorithms have made these advancements possible. Convolutional Neural Networks (CNNs) and other deep learning algorithms have contributed significantly to the development of AI image synthesis methods. Neural networks designed to process and evaluate visual data are known as CNNs. CNNs can learn to recognize patterns, textures, and shapes in images by making use of layers of neurons that are connected. When training AI systems to produce artwork that is both realistic and pleasing to the eye, this capacity to comprehend visual content has been essential⁴.

For AI image synthesis, Generative Adversarial Networks (GANs) have emerged as a potent tool. GANs comprise two parts: a discriminator and a generator. The generator network figures out how to make pictures that look like the preparation information, while the discriminator network figures out how to recognize genuine and created pictures. The generator tries to fool the discriminator, and the discriminator tries to accurately identify the real images, in this adversarial training process. GANs can produce highly convincing and visually coherent images through this iterative process. Various AI image synthesis methods have emerged as a result of advances in GANs. By separating the control of image styles from the content, the Karras-developed StyleGAN, for instance, makes it possible to generate images that are extremely detailed and diverse. AI systems can produce images

⁴ Absalom E. Ezugwu et al., “A Comprehensive Survey of Clustering Algorithms: State-of-the-Art Machine Learning Applications, Taxonomy, Challenges, and Future Research Prospects,” *Engineering Applications of Artificial Intelligence* 110 (2022): 104743, <https://doi.org/10.1016/j.engappai.2022.104743>.

with particular visual styles while still maintaining semantic coherence thanks to this method⁵.

The use of attention mechanisms in AI image synthesis is another significant development. The AI system can fine-tune its control over the generated output by focusing on specific regions or features of an image thanks to attention mechanisms. AI systems can produce results that are more realistic and appealing to the eye by paying attention to relevant image details. In addition, efforts have been made to incorporate context and semantic understanding into AI image synthesis. This includes preparing computer-based intelligence frameworks to produce pictures that stick to explicit imperatives or ideas. For instance, scientists have investigated the age of pictures in light of literary depictions or the exchange of creative styles starting with one picture and then onto the next. AI systems are better able to produce images that are in line with particular artistic goals or conceptual concepts thanks to these methods. Not only have AI image synthesis techniques improved the quality of the generated images, but they have also broadened the range of creative options. Artworks created by AI systems can now demonstrate a variety of styles, compositional methods, and aesthetics. By utilizing the capabilities of AI systems, artists have been able to collaborate with AI as creative partners, exploring new artistic lands and challenging conventional art practices⁶.

⁵ Leonidas Aristodemou and Frank Tietze, “The State-of-the-Art on Intellectual Property Analytics (IPA): A Literature Review on Artificial Intelligence, Machine Learning and Deep Learning Methods for Analysing Intellectual Property (IP) Data,” *World Patent Information* 55 (2018): 37–51, <https://doi.org/10.1016/j.wpi.2018.07.002>.

⁶ Absalom E. Ezugwu et al., “A Comprehensive Survey of Clustering Algorithms: State-of-the-Art Machine Learning Applications, Taxonomy, Challenges, and Future Research Prospects,” *Engineering Applications of Artificial Intelligence* 110 (2022): 104743, <https://doi.org/10.1016/j.engappai.2022.104743>.

In earlier research exploring the utilization of AI in the art world, various theoretical models have been utilized to provide a theoretical basis for understanding the effect of AI image synthesis on the sector⁷. One such framework is the sociology of art, which looks at the social and cultural elements that define the production, consumption, and reception of art. This theory was employed to look into how AI can challenge traditional thoughts on artistic creativity and originality, as well as its potential influence on the art market⁸.

Another model used by past studies is the philosophy of technology. This examines the ethical and philosophical implications of technological innovations. It has been applied to investigate questions related to the essence of creativity, an artist's part in it all, and the genuineness of AI-generated⁹. Previous studies on the use of AI in the art world have drawn upon various theoretical frameworks such as the sociology of art to understand its effect on creativity and the art market, and the philosophy of technology to explore ethical implications. Furthermore, theories of innovation and diffusion have been used to assess the adoption and impact of AI in this sector. These theoretical perspectives have enabled researchers to gain a better understanding of AI's multifaceted impact on the art world¹⁰.

⁷ Cong Ye, "Evolution and Application of Artificial Intelligence Art Design Based on Machine Learning Algorithm," *2021 IEEE 4th International Conference on Information Systems and Computer Aided Education (ICISCAE)*, 2021, <https://doi.org/10.1109/iciscae52414.2021.9590775>.

⁸ Kieran Browne, "Who (or What) Is an AI Artist?," *Leonardo* 55, no. 2 (2022): 130–34, https://doi.org/10.1162/leon_a_02092.

⁹ Cong Ye, "Evolution and Application of Artificial Intelligence Art Design Based on Machine Learning Algorithm," *2021 IEEE 4th International Conference on Information Systems and Computer Aided Education (ICISCAE)*, 2021, <https://doi.org/10.1109/iciscae52414.2021.9590775>.

¹⁰ Justin O'Connor, "Creative Industries: A New Direction?," *International Journal of Cultural Policy* 15, no. 4 (2019): 387–402, <https://doi.org/10.1080/10286630903049920>.

1.2 Literature Review

AI image synthesis is a technique that uses machine learning algorithms to generate new images by combining existing ones. It has the potential to revolutionize the art world by enabling artists to create new and unique visual content¹¹. Previous research has explored the use of strained intelligence (AI) in the art world, particularly in image synthesis¹². The use of AI in art improves art generation; however, it raises important questions concerning the originality of works created through such technology¹³. Several studies have investigated the effects of AI image synthesis on the art market. Some researchers have suggested that AI-generated art could have a significant impact on the market by increasing the number of artworks available and potentially reducing the value of traditional art.

Examining the effects on the art market is not the only area previous research has delved into; they have also explored the consequences of AI on creativity. Some studies believe that AI in art can heighten innovation and inspiration, allowing artists to explore new concepts and methods¹⁴. On the contrary, others contend that AI would lead to a death

¹¹ V Galanos, "Exploring Expanding Expertise: Artificial Intelligence as An ...," *Technology Analysis & Strategic Management*, 2018, <https://www.tandfonline.com/doi/full/10.1080/09537325.2018.1518521>.

¹² Henry W. Lin, Max Tegmark, and David Rolnick, "Why Does Deep and Cheap Learning Work so Well?," *Journal of Statistical Physics* 168, no. 6 (2017): 1223–47, <https://doi.org/10.1007/s10955-017-1836-5>.

¹³ E Shanken, *Art in the information age: Technology and conceptual art*, 2021, <https://www.semanticscholar.org/paper/Art-in-the-Information-Age%3A-Technology-and-Art-Shanken/5f2efbc8a0d88f54d3180c7b92c3c10e3d48682d>.

¹⁴ Cong Ye, "Evolution and Application of Artificial Intelligence Art Design Based on Machine Learning Algorithm," *2021 IEEE 4th International Conference on Information Systems and Computer Aided Education (ICISCAE)*, 2021, <https://doi.org/10.1109/icisca52414.2021.9590775>.

of inventiveness and originality by eliminating human involvement from the creative process¹⁵.

AI picture combination, otherwise called simulated intelligence-produced art or computational innovativeness, is the utilization of AI procedures to produce a visual substance that looks like human-made art. It includes the utilization of calculations, AI, and profound brain organizations to make unique and outwardly engaging pictures. AI picture combination procedures intend to comprehend and copy imaginative styles, structures, and feelings through the investigation and amalgamation of enormous datasets of visual data. At its center, artificial intelligence picture amalgamation depends on the preparation of calculations utilizing broad datasets of existing art. The algorithms learn to recognize patterns, textures, colors, and common compositions in art by being exposed to a wide range of artistic styles and visual characteristics. As a result of this comprehension, the algorithms can produce new images that are comparable to the styles and characteristics of the training data¹⁶.

AI image synthesis has made significant progress thanks to the development of deep learning and machine learning techniques, particularly deep neural networks. Understanding and producing intricate images have relied heavily on Convolutional Neural Networks (CNNs), a type of deep neural network designed specifically for processing visual data. CNNs can identify objects, textures, and other visual elements in images thanks to their ability to learn from enormous amounts of training data and extract hierarchical

¹⁵ C Didier, Acknowledging ai's dark side. | semantic scholar, 2015, <https://www.semanticscholar.org/paper/Acknowledging-AI's-dark-side.-Didier-Duan/a8c7ef28e5e0b01ff78519b4e5c322740d6afe79>.

¹⁶ Somesh Mohapatra and Daniel Griffin, *Ai-Assisted Chemical Reaction Impurity Prediction and Propagation*, 2022, <https://doi.org/10.26434/chemrxiv-2022-tcm0z>.

features. One huge forward leap in man-made intelligence picture combination is the improvement of Generative Ill-disposed Organizations (GANs). In 2014, Ian Goodfellow and his colleagues introduced GANs, which are made up of two neural networks: a generator organization and a discriminator organization. The discriminator network learns to distinguish between real and generated images, while the generator network learns to create images that are similar to the training data. Through an ill-disposed preparation process, the generator network ceaselessly works on its capacity to create outwardly persuading and sensible pictures, directed by criticism from the discriminator organization¹⁷.

Artists now have more opportunities to explore and experiment with their creative process as a result of the incorporation of AI image synthesis techniques into artistic creation. The artist's artistic vision and expression can be enhanced and enhanced by AI, which can be a useful tool and collaborator. Specialists can use simulated intelligence calculations to create starting thoughts, investigate different imaginative styles, and examine with synthesis and variety plans. Man-made intelligence picture combination methods likewise give craftsmen the capacity to make art at an uncommon scale and speed¹⁸. Artists can focus on conceptualization and higher-level decision-making by automating certain aspects of the creative process, such as creating background elements or fine-tuning particular details. This results in more efficient and prolific art production. The joining of computer-based intelligence in imaginative creation has likewise worked

¹⁷ Claire Empel and Rene M. Koenigs, "Artificial-intelligence-driven Organic Synthesis—En Route towards Autonomous Synthesis?," *Angewandte Chemie International Edition* 58, no. 48 (2019): 17114–16, <https://doi.org/10.1002/anie.201911062>.

¹⁸ Wayne Holmes and Ilkka Tuomi, "State of the Art and Practice in <sc>ai</sc> in Education," *European Journal of Education* 57, no. 4 (2022): 542–70, <https://doi.org/10.1111/ejed.12533>.

with interdisciplinary coordinated efforts among craftsmen and PC researchers. Specialists can team up with artificial intelligence specialists to foster altered calculations or frameworks that line up with their imaginative vision. These joint efforts cultivate cross-fertilization of thoughts, skills, and procedures, prompting the formation of inventive and limit-pushing art¹⁹.

One critical effect is the redefinition of the imaginative inventive approach. With man-made intelligence frameworks fit for creating art, the center movements from manual execution to the conceptualization and curation of the produced yield. Specialists can investigate the job of goal, translation, and choice in the making of fine arts. Artists are inspired to engage in a more iterative and collaborative process by AI systems' generative capabilities, which leads to new ways of thinking about artistic creation. The utilization of AI picture amalgamation additionally brings up issues about the customary comprehension of imaginative creation. While AI frameworks produce the visual result, human specialists assume a vital part in organizing the preparation of information, calibrating the artificial intelligence calculations, and pursuing imaginative choices during the generative cycle²⁰. This obscuring of initiation raises banters on the degree to which artificial intelligence frameworks can be considered as co-makers or partners. It challenges the customary thought of the lone virtuoso craftsman and underlines the significance of human organization and expectation in the creative cycle. Besides, AI-created art has provoked conversations around the worth and meaning of fine arts. The art market has been affected

¹⁹ Walter Lau Neto et al., "LSORACLE: A Logic Synthesis Framework Driven by Artificial Intelligence: Invited Paper," *2019 IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, 2019, <https://doi.org/10.1109/iccad45719.2019.8942145>.

²⁰ Claire Empel and Rene M. Koenigs, "Artificial-intelligence-driven Organic Synthesis—En Route towards Autonomous Synthesis?," *Angewandte Chemie International Edition* 58, no. 48 (2019): 17114–16, <https://doi.org/10.1002/anie.201911062>.

by the passage of simulated intelligence created works of art, bringing up issues about their market interest, evaluation, and the apparent worth of customary fine arts. Authorities and art organizations are confronted with choices regarding the obtaining, presentation, and valuation of man-made intelligence-created art. The mix of AI in the art market requires a reexamination of customary measurements and standards for surveying and esteeming fine arts²¹.

AI image synthesis is a technique that uses machine learning algorithms to generate new images by combining existing ones. It has the potential to revolutionize the art world by enabling artists to create new and unique visual content²². Previous research has explored the use of strained intelligence (AI) in the art world, particularly in image synthesis²³. The use of AI in art improves art generation; however, it raises important questions concerning the originality of works created through such technology²⁴. Several studies have investigated the effects of AI image synthesis on the art market. Some researchers have suggested that AI-generated art could have a significant impact on the market by increasing the number of artworks available and potentially reducing the value of traditional art.

Examining the effects on the art market is not the only area previous research has delved into; they have also explored the consequences of AI on creativity. Some studies

²¹ Wayne Holmes and Ilkka Tuomi, "State of the Art and Practice in <sc>ai</sc> in Education," *European Journal of Education* 57, no. 4 (2022): 542–70, <https://doi.org/10.1111/ejed.12533>.

²² V Galanos, "Exploring Expanding Expertise: Artificial Intelligence as An ...," *Technology Analysis & Strategic Management*, 2018, <https://www.tandfonline.com/doi/full/10.1080/09537325.2018.1518521>.

²³ Henry W. Lin, Max Tegmark, and David Rolnick, "Why Does Deep and Cheap Learning Work so Well?," *Journal of Statistical Physics* 168, no. 6 (2017): 1223–47, <https://doi.org/10.1007/s10955-017-1836-5>.

²⁴ E Shanken, "Art in the information age: Technology and conceptual art, 2021," <https://www.semanticscholar.org/paper/Art-in-the-Information-Age%3A-Technology-and-Art-Shanken/5f2efbc8a0d88f54d3180c7b92c3c10e3d48682d>.

believe that AI in art can heighten innovation and inspiration, allowing artists to explore new concepts and methods²⁵. On the contrary, others contend that AI would lead to a death of inventiveness and originality by eliminating human involvement from the creative process²⁶.

1.3 Organization of the Thesis

The thesis consists of six chapters. Chapter 1 provides an introduction to the research background, literature review, research objectives, and thesis structure.

Chapter 2 analyzes the issue of originality in AI image synthesis technology, explores the relationship between human designers and AI synthesis technology in the creative process, and offers recommendations on how to address the question of originality in AI image synthesis.

Chapter 3 discusses the ethical concerns in AI image synthesis technology and conducts an in-depth study on strategies for addressing ethical issues in AI.

Chapter 4 explores the issue of technological dependence in AI image synthesis technology, analyzes the convenience that this technology brings to designers, and discusses how designers should approach the topic of AI in their work.

²⁵ Cong Ye, "Evolution and Application of Artificial Intelligence Art Design Based on Machine Learning Algorithm," *2021 IEEE 4th International Conference on Information Systems and Computer Aided Education (ICISCAE)*, 2021, <https://doi.org/10.1109/iciscae52414.2021.9590775>.

²⁶ C Didier, Acknowledging ai's dark side. | semantic scholar, 2015, <https://www.semanticscholar.org/paper/Acknowledging-AI's-dark-side.-Didier-Duan/a8c7ef28e5e0b01ff78519b4e5c322740d6afe79>.

Chapter 5 conducts research on how AI image synthesis technology affects the market for selling graphic design artworks. By employing methods such as field visits, data comparison, and conclusion analysis, it summarizes the current market situation and makes predictions about the future art market.

Chapter 6 concludes the main findings, insights, and recommendations of this study. It provides practical advice for the graphic design field on how to navigate this ever-changing landscape and emphasizes the importance of this research in understanding the impact of AI image synthesis on the domain of graphic design.

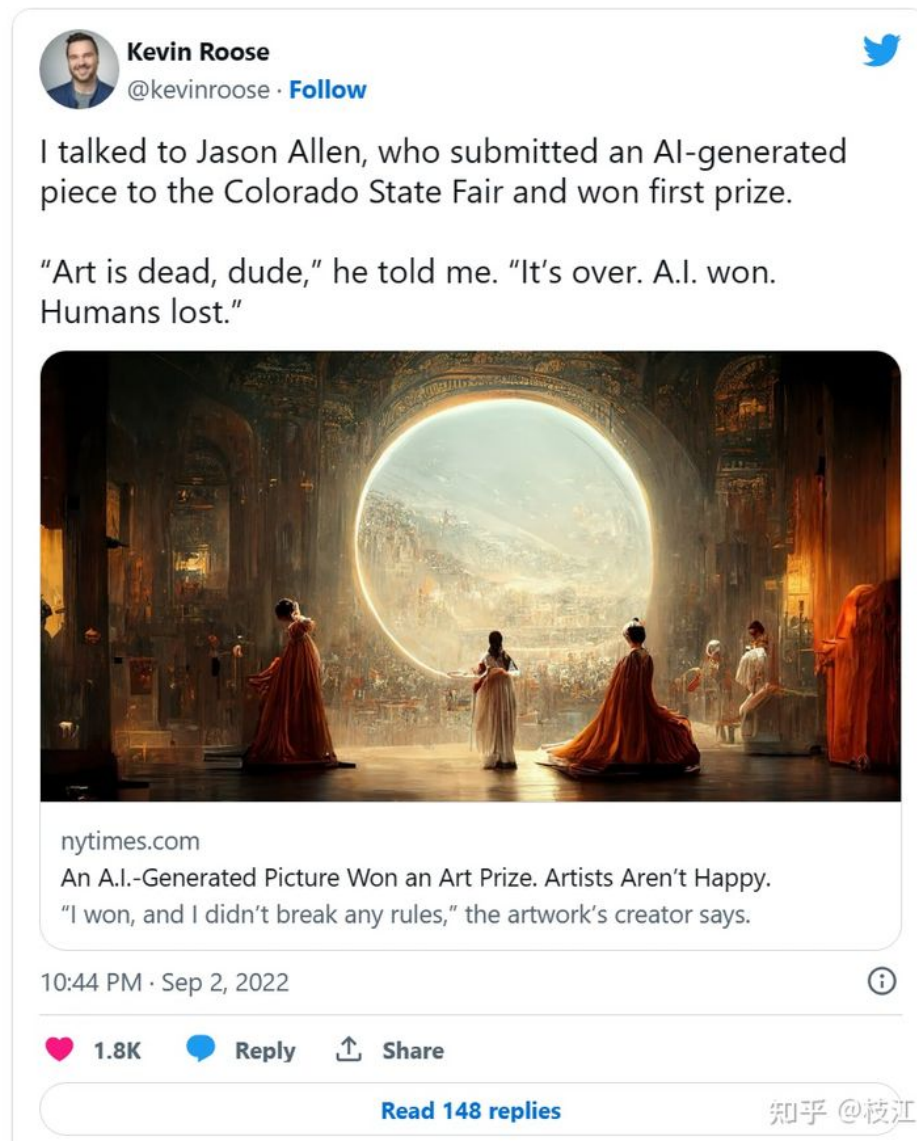
2. Chapter 2 The originality problem of the AI-powered image synthesis technology

AI image synthesis technology can generate new images by learning from a large amount of image data, which raises questions about originality. Due to the replicating ability of AI algorithms, it is difficult to determine whether the generated images are truly original or just copies and modifications of existing images.

The international copyright law has no explicit requirement on “originality”. However, the preparatory working paper of the Brussels Revision Conference of the Berne Convention shows that the requirement of “intellectual creations” is implied in the concept of “literary and artistic works”. The Article 2, Paragraph 5 of the Berne Convention explicitly provides that “collections of literary or artistic works such as encyclopedias and anthologies, because of the selection and arrangement of their contents, constitute intellectual creations”. Despite the necessity of such a provision for this kind of collection, no extra provision is needed for “mainstream” works covered by Article 2, Paragraph 1. However, there are almost no definitive concepts or judgment criteria as to what are “intellectual creations”. Hence, members of the Berne Union may, and indeed do, have different attitudes towards originality. Actually, different jurisdictions adopt different judgment criteria, including “labor, skill and judgment”, “skill and judgment”, “minimum creativity”, “the creator’s personal traits”, “intellectual contribution”, “personal intellectual creation” and “the creator’s own intellectual creation”. Variations in judgment criteria reflect the specific copyright conception prevailing in these jurisdictions.

In 2022, an AI-created artwork earned recognition. Artist Jason Allen employed Midtravel, a generative AI system trained on art collected from the internet, to craft this piece. The process was far from fully automated; Allen spent around 80 hours completing

approximately 900 iterations to create and refine his work. However, his use of AI to win an art competition triggered a strong online backlash, with one Twitter user declaring, "We are witnessing the demise of art unfolding right before our eyes."



As generative AI art tools like Midjourney and Stable Diffusion come into the spotlight, questions of ownership and authorship inevitably emerge. These tools derive their generative capabilities from being trained on a multitude of previous artworks, with AI learning how to produce artistic outputs. Should artists whose works were freely used

to train these models be compensated? Who holds the rights to images generated by artificial intelligence systems? Is the process of refining prompts from generative AI a legitimate form of creative expression? On one side, tech enthusiasts applaud works like Allen's. Conversely, many working artists perceive the use of their art to train AI as exploitative. While copyright laws were established to foster art and creative thinking, the ascent of generative AI complicates traditional notions of authorship. because AI can generate works similar to human creations and even surpass human imagination in some aspects. Therefore, the judgment criteria for originality face a greater challenge in the AI era.

2.1 The relationship between human designers and AI synthesis technology in the creation process

In Midjourney, designers' input is mainly reflected by textual instructions given to AI used to tell the latter what kind of images should be generated. These textual instructions can either be highly specific and detailed or very abstract and ambiguous. For example, "draw a blue cat" is a specific and detailed instruction, while "draw a dream" is a very abstract and ambiguous one. Different types or styles of instructions may affect the quality and effect of AI-generated images. Generally, specific and detailed instructions can be more easily understood and implemented by AI but they also limit its creativity. Comparatively, abstract and ambiguous instructions are more likely to arouse the imagination and creativity of AI, but they may lead to AI-generated images that are inconsistent with designers' intentions or human aesthetics. Different types or styles of instruction may affect human satisfaction and evaluation of AI-generated results. Generally

speaking, realistic and refined images are more likely to be accepted by humans but may lack novelty and creativity. Abstract and artistic images are more likely to demonstrate the novelty and creativity of AI but may go beyond the scope of human understanding and appreciation. Designers' input provides the goal, direction and constraints of creation, while the AI technology offers the means, method and possibility of creation. A good communication and feedback mechanism is needed between them to ensure a smooth creation process and the quality of creation outcomes.

2.2 How to view the originality problem in AI image synthesis technology

On the one hand, if AI-generated works are considered to have competitiveness and market value, then it should be acknowledged that AI plays a positive role in the creative industry by, for example, improving productivity, reducing cost, expanding the market and increasing diversity. This may not only facilitate the development and innovation of the creative industry but also bring new business opportunities and cooperation models. On the other hand, if AI-generated works are considered to lack competitiveness and market value, then it should be acknowledged that AI produces negative effects in the creative industry such as reducing quality, causing infringement, and damaging fairness and trust. This may not only inhibit the development and innovation of the creative industry but also bring new risks and challenges. The judgment criteria of originality does not arbitrarily mean that all types of works should be judged based on one set of criteria, or that changes in creation approaches and communication models brought by technology should be disregarded. We should allow corresponding adjustment and interpretation of the criteria depending on the expressive forms of different works. Technological development never

stops. In the face of challenges brought on by technological reforms, works at different originality levels should be adjusted through the means of judicial interpretation apart from giving reasonable explanations of existing theories using hermeneutical approaches in combination with the inclusiveness of language. In accordance with the provisions of the Copyright Law of the People's Republic of China, there have been instances in the past where AI-generated works were acknowledged to have copyright. However, with the increasing prevalence of AI-generated content, the question of whether future adjustments will be made within copyright law to better accommodate AI works remains to be seen and will require time for verification.

In essence, it is crucial to ensure that a work possesses originality, meaning that both the creative process and the final presentation reflect the author's unique creativity and innovative thinking. Simultaneously, it is imperative to guarantee that the work does not infringe upon the copyrights and intellectual property of others.

3. Chapter 3 The ethicality problem of the AI-powered image synthesis technology

The coordination of artificial intelligence picture amalgamation in the art world raises significant moral and copyright contemplations. As artificial intelligence-produced art turns out to be more common, it is essential to look at the moral ramifications of its creation, proprietorship, and dispersal, as well as the copyright gives that emerge from the utilization of artificial intelligence calculations in the imaginative cycle. The issue of authorship and the role that human artists play in the creation of AI-generated artworks is one of the most important ethical considerations. While computer-based intelligence calculations produce the visual result, human specialists assume a critical part in organizing the preparation of information, calibrating the simulated intelligence calculations, and settling on imaginative choices during the generative cycle. Deciding the degree of human organization and expectation in AI art is a complex moral inquiry that challenges conventional thoughts of imaginative creation. This issue must be addressed openly by artists, AI developers, and art institutions, and proper credit must be given to all contributors to the artistic process²⁷.

Questions of originality and creativity are also included in the ethical implications of AI-generated art. The creation of art by AI systems, according to critics, is merely an imitation of existing styles and patterns. Others contend that artificial intelligence calculations can deliver creative and astonishing results that go past the human creative mind. In the context of AI-generated art, a deeper comprehension of what constitutes

²⁷ Yasar Abbas Rehman et al., "Face Liveness Detection Using Convolutional-Features Fusion of Real and Deep Network Generated Face Images," *Journal of Visual Communication and Image Representation* 59 (2019): 574–82, <https://doi.org/10.1016/j.jvcir.2019.02.014>.

creativity and originality is necessary for resolving this dispute. To guarantee authenticity and transparency in the creation and attribution of AI-generated artworks, ethical guidelines and practices should be developed. Ethical considerations regarding the impact on human artists and their livelihoods are also raised by the use of AI image synthesis in the art industry. Concerns have been expressed regarding the possibility of AI systems displacing human artists. While artificial intelligence (AI) has the potential to enhance artistic production, it is essential to ensure that art produced by AI does not diminish or eclipse the contributions of human artists. Art foundations and policymakers should consider components to help and safeguard the freedoms and livelihoods of craftsmen in an AI-implanted art environment²⁸.

Copyright contemplations are principal in the domain of man-made intelligence-produced art. The utilization of existing works of art and datasets to prepare man-made intelligence calculations brings up issues about the fair utilization of protected material. Specialists and computer-based intelligence designers should be cautious in guaranteeing that their work consents to intellectual property regulations and regards the privileges of unique makers. To safeguard the interests of all parties involved, it is essential to establish straightforward policies and procedures for the ethical and legal utilization of copyrighted content in AI image synthesis. In addition, AI-generated art raises issues of ownership and provenance. In the world of digital art, blockchain technology and non-fungible tokens (NFTs) have emerged as potential methods for establishing ownership, provenance, and authenticity. However, it is still difficult to guarantee these systems' transparency, safety,

²⁸ Blair Attard-Frost, Andrés De los Ríos, and Deneille R. Walters, "The Ethics of AI Business Practices: A Review of 47 AI Ethics Guidelines," *AI and Ethics* 3, no. 2 (2022): 389–406, <https://doi.org/10.1007/s43681-022-00156-6>

and longevity. A coordinated effort among specialists, man-made intelligence engineers, art organizations, and lawful specialists is important to lay out vigorous systems for the moral possession and confirmation of artificial intelligence-produced art²⁹.

The continuous development of AI technology has also been coupled with increasingly severe infringements on personal privacy and data security. Many AI technologies need to be trained by massive data to boost their intelligence and autonomous learning capacity. These data, however, may contain some sensitive information such as personal browsing history, geographic location and purchase habits, which can be easily hacked or hijacked, causing the risk of personal privacy leakage. The promotion and application of AI may further break the boundaries of human ethicality such as AI regulation, the consciousness and creativity of AI and AI and decision-making. Different societies, cultural backgrounds and religious beliefs hold different ethical standards and bottom lines, posing a challenge for the introduction and regulation of AI. How to ensure the application of AI does not compromise human ethicality, justice and human rights is one of the fundamental problems that should be considered and addressed.

AI-generated audio-visual works are becoming progressively lifelike, posing a significant challenge in distinguishing between authentic and AI-generated content. Sharing manipulated photos on social media can mislead the public, and some AI-generated images may contain inappropriate content such as violence, pornography, or racial discrimination. Such content has the potential to ignite social controversies and moral

²⁹ Sivan Tamir, “Artificial Intelligence in Human Reproduction: Charting the Ethical Debate over AI in IVF,” *AI and Ethics* 3, no. 3 (2022): 947–61, <https://doi.org/10.1007/s43681-022-00216-x>.

concerns, negatively impacting the growth of children and adolescents and potentially crossing societal moral boundaries.

3.1 How to distinguish AI synthesized Image

Thanks to image generators like Open AI's DALL-E2, Midjourney, and Stable Diffusion, AI-generated images are more realistic than ever, and integrated video production technology is advancing rapidly. Tasks like face swapping, changing clothes, and backgrounds, and transforming 2D into 3D can now be automatically generated. However, current generated images are not flawless, especially when it comes to depicting individuals. Some image generators may struggle to create realistic details such as hands, teeth, glasses, and jewelry. In images featuring multiple individuals, there may be additional irregularities. Authenticity can be assessed by scrutinizing details; AI-generated photos often reveal some unnatural aspects, such as issues with proportions, projection, lighting, shadows, and textures. Additionally, one can examine the background and environment of the photo to determine its alignment with reality. Look for unnatural or unrealistic features in images or videos; for instance, AI-generated images may display a blurry or distorted background or faces that appear excessively perfect.

Some researchers are currently working on algorithms based on deep learning that can automatically identify photos generated by AI. These algorithms analyze the pixels and textures in photos to determine their authenticity. However, tools for detecting AI-generated content are not always reliable. It's important not to overly depend on these tools or neglect their regular updates. For instance, the absence of blinking was once a characteristic suggesting a video might be artificially generated, but this is no longer the

case. AI generation models release improved versions of applications almost every day, and it's entirely possible for AI to generate visually flawless and lifelike images.

We are still in the early stages of AI, and there are inherent risks in applying artificial intelligence. Whether we like it or not, generative AI tools are being integrated into various applications, from email and search engines to document editing and chat tools. The best way to understand how the technology works and what it can and cannot do is to personally experiment with it. However, when using AI applications, pay attention to the following:

Privacy: Be cautious about sharing personal information with AI software. The system might use your input to train algorithms, and others might access the content you input.

Ethics: What are you creating with AI? Are you asking an image generator to replicate the works of living artists? Does the generated image infringe on someone else's portrait rights?

Permissions: If you are creating a portrait of someone, do they agree with it?

Disclosure: If sharing AI creations on social media, make it clear that they are computer-generated. Are others allowed to share them?

Accuracy: Double-check before publishing or sharing any significant information.

3.2 Countermeasures for AI Ethicality Problem

Familiarity with AI-generated art: Interviewees had to change levels of knowledge of computer-based intelligence-created art. Some people were very familiar with this kind of art, while others were not at all or only had a limited understanding. This suggests that awareness and education regarding AI-generated art are required to ensure a better comprehension of its implications for the art world.

(1). Establishing appropriate laws and regulations

To cope with the AI ethicality problem, laws and regulations suited to realistic conditions and legal norms should be established. Governments and industrial organizations should formulate and improve relevant laws, regulations and ethical norms to specify the responsibilities and rights of AI robots and privacy protection and censorship institutions, thereby giving rise to accumulated norms and overall societal beliefs. In the meantime, comprehensive publicity and implementation of relevant institutions will be helpful for understanding and addressing AI ethicality problems within the society.

(2). Enhancing the transparency of the AI technology

The rapid development of AI and the proliferation of its application in social areas has brought immense benefits as well as certain risks. AI can truly serve the society only when it is healthy, stable, controllable and trusted by the public. Improving technological transparency is a very good choice as it boosts the interpretation and predictive capacity of AI algorithms, reduces risks associated with technology applications and enhances social trust.

(3). Improving security and privacy protection of AI robots

AI systems may cause many security and privacy problems in their application. To prevent these problems, the security and privacy protection of AI robots should be enhanced. To test and protect AI algorithms and their applicative technologies, it is necessary to establish sophisticated security mechanisms to ensure the security, confidentiality and usability of robots and strict investigation of security problems like vulnerabilities, hacking and privacy leakage. Attention should also be given to the privacy protection of AI robots to avoid massive data leakage. In this regard, encryption and protective measures should be implemented to boost the security and privacy of big data.

(4). Facilitating man-machine collaboration

The collaboration between AI systems as a tool and humans can replace humans to complete some complicated or dangerous tasks, thereby improving social productivity, and reducing working time and economic costs. However, the application of AI must be brought under human control. By enhancing the mutual trust between AI robots and man and ensuring good collaboration and communication, AI can be differentiated conceptually from traditional robots, which also constitutes an effective approach to addressing the ethical problem of AI technology. AI robots have to provide interfaces for the collaboration between man and technologies and allow users to use them depending on their preferences and needs.

4. Chapter 4 The technological dependency problem of the AI-powered image synthesis technology

With the development of AI technology, AI painting technology has been broadly applied in graphic design. It not only improves the productivity of graphic designers but also provides them with more inspiration and possibilities. Undeniably, it also has some problems and challenges. However, AI painting technology represents a huge opportunity for graphic designers as long as its strengths are leveraged. Many designers' conceptualizations are rooted in summarizing and recombining existing design forms and techniques. Genuine innovation is a rarity, demanding continuous experimentation and the accumulation of experience. Designers have the potential to lead a design trend and eventually transform innovation into a universally embraced design form through persistent trial and error. When designers embark on a new project, they analyze competing products, pinpoint issues based on the design object's attributes, propose improvements, optimize through practice, ignite inspiration, refine iteratively, express through visual symbols, convey to the public, and further optimize for subsequent projects based on viewer feedback. In "The Three-Body Problem," aliens excel in technology but cannot replace the beauty of human philosophy and poetry. Designers' cultural heritage, aesthetic sensibilities, and understanding of humanity are assets; designers are not mere tools and should approach things from a human perspective. Another effective work mode involves establishing a designer's personalized module database, summarizing and categorizing years of design experience. Some design work can be modularized and technologized, akin to establishing a design specification. The creative aspect of the work requires the accumulation of designers' life experiences and expressive thinking abilities. The core

question in future graphic design is how designers should cognate, transform to and focus on appropriate areas.

4.1 Conveniences brought by AI-powered image synthesis technology to designers

AI enables designers to rapidly and comprehensively pre-research preparations for a certain task; it can also assist with understanding user needs and market trends, followed by giving guiding or strategic suggestions. Hence, time and labor costs can be saved in stages of data collection and analysis, group analysis and questionnaire design prior to research. Additionally, the batch processing capacity of AI means that tasks like digital analysis and conclusion drawing after questionnaire or survey data collection can be completely commissioned to AI. In the process of proposal making, AI can deliver creative, well-informed proposals, which are better than outcomes of human thinking in terms of directions and dimensions, through rapid simulations. On that basis, designers are able to make manual additions or deletions to gain insight to a broader picture and further clarify the definition of products. Despite the high participatory degree of AI in the workflow, it still relies upon human intervention, organization, sorting and transmission, which means what AI replaces is actually tasks involving mechanical output to offset a fraction of human labor and reduce the cost of input in work. In areas of collaboration and integration, designers are still essential for intervention and management.

In the real-world application of AI tools, it's evident that today's AI is formidable but not flawless. To put it more accurately, AI products in various scenarios often face challenges or fall short of human capabilities. Nevertheless, it's crucial to harness AI in

domains where it outperforms humans and, at the same time, be mindful of its limitations, taking steps to work around them.

1) Graphic Design: Creative Illustrations, Image Generation

The more concrete and complex, the better the effect: AI in graphic generation, represented by star products like Midjourney, Stable Diffusion, and DALL-E, uses large models to produce results through text-to-image or image-to-image approaches. In generating images, AI performs better with more concreteness because concrete descriptions can nail down many key features. Abstraction is more challenging to describe.

2) Text Generation

Text-based generative AI is relatively mature, with products like ChatGPT, iFlyTek Xinghuo, and various language models giving rise to a range of text-based conversational AI products and plugins. Taking ChatGPT as an example, it excels in answering questions about objective and rule-based content and possesses generalization abilities, such as in reasoning, summarizing, common sense, and translation. Combining this with design scenarios, utilizing the analytical, reasoning, and summarization abilities of large language models can assist in tasks like content summarization, report content extraction, knowledge interpretation, content continuation, creative ideation, and brainstorming.

The AI boom is here, especially in the explosive growth of intelligent applications. For designers in content production, though substitution is not imminent, efficiency and quality improvement in commercial content production are already happening and will profoundly change the future development of commercial content production.

4.2 How designers should face AI technology

For designers, the emergence of the AI painting technology can immensely save their time and energy. In the past, designers needed to manually draw elements related to figures, compositions and colors, which consumed large amounts of time and energy. With the assistance of AI technology, graphic designers only need to provide some basic elements and computers can automatically generate and optimize the images, thereby significantly improving productivity. AI technology also provides designers with more inspiration and possibilities. In the design process, designers can use AI to generate a variety of forms of images and color schemes and even different styles of images based on different scenes and needs, thus providing more choices for graphic designers. Although AI painting technology can make up for the limitations of designers in illustration, materials and copywriting, it cannot compensate for the weakness in design capability. When using AI technology, graphic designers should focus more on comprehensive improvement in commercial design. Apart from efforts put in design, they should also devote more to brand strategy, design fundamentals and marketing capabilities. In general, designers should formulate appropriate boundaries while applying AI to reserve the room for flexibility and uniqueness; cooperate with humans to leverage teamwork strengths while mastering and applying AI technologies; and constantly innovate and explore new design areas and approaches and maintain acute observation and aspiration to increase their competitiveness.

The key distinction between design and art lies in the fact that design is oriented toward serving business purposes. Focusing solely on design outcomes is insufficient; attention should also be given to cultivating creativity. The true value of design likely

manifests in producing positive business results. Understanding business models, marketing, mass communication, and other design-related knowledge, breaking boundaries, and engaging in cross-disciplinary learning are essential for designers. Designers should contemplate the integration of business and design from various perspectives, employ design to enhance business value and position a company's brand by understanding its strategic vision. Creating a brand effect through the most suitable visual image, showcasing design works through marketing communication, receiving market feedback, and further advancing the implementation of business plans are pivotal steps.

5. Chapter 5 How AI Image Synthesis Technology affects the sales market of graphic design and artistic products

The joining of AI picture blends in the art world has achieved tremendous changes in imaginative creation and utilization of designs. AI-created art has extended the scope of imaginative styles and feels accessible, considering the investigation of novel and different creative articulations. Now, AI techniques can be used by artists to create works of art that challenge conventional artistic norms and push the boundaries of conventional art practices. The use of artificial intelligence in the production of art has also made it possible to create art at a faster and larger scale³⁰. AI calculations can create fine arts with striking velocity and productivity, empowering specialists to deliver a more noteworthy volume of work. Because AI-generated art can reach a wider audience through a variety of digital platforms and online marketplaces, this increased production capacity has implications for the availability and accessibility of artwork. In addition, audience consumption and experience of art have been influenced by AI image synthesis. Watchers are presented with a more extensive scope of creative styles and translations, improving their craft appreciation and understanding. The openness of AI-produced art through advanced stages has democratized the art experience, permitting people from different foundations to draw in with and investigate art in new ways³¹.

The art market's reevaluation of pricing and valuation is one notable effect. Artificial intelligence created fine arts challenges conventional valuing models in light of

³⁰ Wayne Holmes and Ilkka Tuomi, "State of the Art and Practice in <sc>ai</Sc> in Education," *European Journal of Education* 57, no. 4 (2022): 542–70, <https://doi.org/10.1111/ejed.12533>.

³¹ Andrea L. Welker, "Geotechnical Engineering Education: The State of the Practice in 2011," *Geotechnical Engineering State of the Art and Practice*, 2012, <https://doi.org/10.1061/9780784412138.0029>.

elements like craftsman notoriety, authentic importance, and shortage. The quality of the AI algorithm, the uniqueness of the generated output, and the artwork's conceptual and contextual aspects all need to be taken into consideration when determining its value. Authorities and art establishments need to explore these new valuation standards to settle on informed conclusions about the procurement and offer of simulated intelligence created art. Additionally, new revenue streams and business models have emerged as a result of AI's integration into the art market³². Through online platforms, AI-generated art can be sold directly to collectors or auctioned alongside traditional artwork. A few craftsmen and simulated intelligence engineers have embraced the computerized idea of simulated intelligence created art, investigating non-fungible tokens (NFTs) and blockchain innovation for laying out possession, provenance, and legitimacy. The consideration of man-made intelligence created art in the art market has additionally brought up issues about the connection between AI and customary artistic expressions. Some contend that AI-produced art might eclipse or depreciate conventional fine arts, while others consider it to be a reciprocal and creative expansion of imaginative articulation. The conjunction and cooperation between simulated intelligence-produced art and customary fine arts make a dynamic and developing art market scene³³.

With the widespread application of artificial intelligence image synthesis technology, more and more AI synthesized images are appearing in the art market. This chapter will be collecting, analyzing, and integrating both quantitative and qualitative data,

³² Andrea L. Welker, "Geotechnical Engineering Education: The State of the Practice in 2011," *Geotechnical Engineering State of the Art and Practice*, 2012, <https://doi.org/10.1061/9780784412138.0029>.

³³ Han Qiao, Vivian Liu, and Lydia Chilton, "Initial Images: Using Image Prompts to Improve Subject Representation in Multimodal AI Generated Art," *Creativity and Cognition*, 2022, <https://doi.org/10.1145/3527927.3532792>.

then triangulating the findings to compare results from both kinds of data, will provide a more comprehensive insight into AI image synthesis's effects on the art world³⁴.

To lead this methodology, a blend of primary and secondary data will be used. Surveys and interviews with artists, art collectors, institutions, and other stakeholders in the art world will be used to collect primary data. The overviews will assemble quantitative information in regards to perspectives towards artificial intelligence picture combination, the impression of its effect on conventional art rehearses and the art market, and bits of knowledge into the moral contemplations encompassing simulated intelligence-produced art. The meetings will give extra subjective information, presenting top-to-bottom viewpoints and encounters of people associated with the art business³⁵.

Academic journals, books, industry reports, and online databases will all be used to collect secondary data. This optional information will give a more extensive setting to the exploration, offering bits of knowledge into the current writing and past examinations connected with the computer-based intelligence picture blend and its effect on the art world. The examination of optional information will assist with distinguishing holes in the current writing and give an establishment to additional examination.

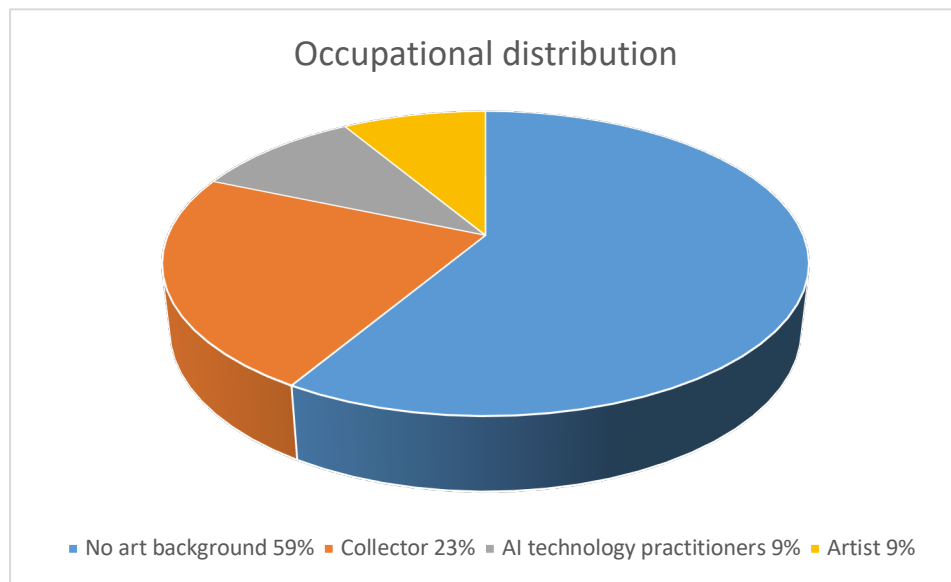
Patterns and correlations will be discovered through statistical analysis of the collected data. Clear insights will be utilized, to sum up the attributes of the information, while inferential measurements, for example, relapse examination, will be utilized to

³⁴ Rachel Muir, "Patient Participation in Critical Care Research, Service Design, and Care Delivery," *Intensive and Critical Care Nursing* 73 (2022): 103298, <https://doi.org/10.1016/j.iccn.2022.103298>.

³⁵ Lesley Eleanor Tomaszewski, Jill Zarestky, and Elsa Gonzalez, "Planning Qualitative Research: Design and Decision Making for New Researchers," *International Journal of Qualitative Methods* 19 (2020): 160940692096717, <https://doi.org/10.1177/1609406920967174>.

analyze connections between factors. For instance, relapse examination can be utilized to evaluate the connection between the presentation of man-made intelligence created art and changes in the worth of customary art. Additionally, cluster analysis can be used to identify distinct art market segments that may be affected differently by AI adoption³⁶.

5.1 Response to Interview Questions



All responses from interviewees only represent individual cases within their respective groups.

³⁶ Sawsan Abutabenjeh and Raed Jaradat, "Clarification of Research Design, Research Methods, and Research Methodology," *Teaching Public Administration* 36, no. 3 (2018): 237–58, <https://doi.org/10.1177/0144739418775787>.

Interviewee 1 Artist: Graphic designer

How would you rate your familiarity with AI-generated art?

Response: Very familiar

Have you purchased any Graphic Design art in the past year?

Response: Yes

Have you purchased any AI-generated art in the past year?

Response: No

On a scale of 1 to 5, please rate your overall satisfaction with Graphic Design art purchases.

Response: 4 (Satisfied)

On a scale of 1 to 5, please rate your overall satisfaction with AI-generated art purchases.

Response: 4 (Satisfied)

In your opinion, how has the introduction of AI-generated art influenced the value of Graphic Design art?

Response: Increased slightly

Please select the market segments that you believe are most influenced by the adoption of AI-generated art.

Response: Art collectors, Art galleries

How important are ethical considerations in your decision to purchase AI-generated art?

Response: Very important

Have you encountered any issues related to copyright or ownership when it comes to AI-generated art?

Response: No

How do you perceive the impact of AI-generated art on the diversity of artistic expression?

Response: Enhancing diversity

Interviewee 2: No artistic background

How would you rate your familiarity with AI-generated art?

Response: Somewhat familiar

Have you purchased any Graphic Design art in the past year?

Response: No

Have you purchased any AI-generated art in the past year?

Response: No

On a scale of 1 to 5, please rate your overall satisfaction with Graphic Design art purchases.

Response: 4 (Satisfied)

On a scale of 1 to 5, please rate your overall satisfaction with AI-generated art purchases.

Response: 3 (Neutral)

In your opinion, how has the introduction of AI-generated art influenced the value of Graphic Design art?

Response: No significant change

Please select the market segments that you believe are most influenced by the adoption of AI-generated art.

Response: Emerging artists

How important are ethical considerations in your decision to purchase AI-generated art?

Response: Not important

Have you encountered any issues related to copyright or ownership when it comes to AI-generated art?

Response: No

How do you perceive the impact of AI-generated art on the diversity of artistic expression?

Response: Limited impact on diversity

Interviewee 3: AI technology practitioner

How would you rate your familiarity with AI-generated art?

Somewhat familiar

Have you purchased any Graphic Design art in the past year?

No

Have you purchased any AI-generated art in the past year?

No

On a scale of 1 to 5, please rate your overall satisfaction with Graphic Design art purchases.

3 (Neutral)

On a scale of 1 to 5, please rate your overall satisfaction with AI-generated art purchases.

4 (Satisfied)

In your opinion, how has the introduction of AI-generated art influenced the value of Graphic Design art?

No significant change

Please select the market segments that you believe are most influenced by the adoption of AI-generated art.

Art galleries

How important are ethical considerations in your decision to purchase AI-generated art?

Not important

Have you encountered any issues related to copyright or ownership when it comes to AI-generated art?

No

How do you perceive the impact of AI-generated art on the diversity of artistic expression?

Limited impact on diversity

Interviewee 4: Collector

How would you rate your familiarity with AI-generated art?

Very familiar

Have you purchased any Graphic Design art in the past year?

Yes

Have you purchased any AI-generated art in the past year?

Yes

On a scale of 1 to 5, please rate your overall satisfaction with Graphic Design art purchases.

4 (Satisfied)

On a scale of 1 to 5, please rate your overall satisfaction with AI-generated art purchases.

3 (Neutral)

In your opinion, how has the introduction of AI-generated art influenced the value of Graphic Design art?

Decreased slightly

Please select the market segments that you believe are most influenced by the adoption of AI-generated art.

Emerging artists, Art collectors

How important are ethical considerations in your decision to purchase AI-generated art?

Very important

Have you encountered any issues related to copyright or ownership when it comes to AI-generated art?

Yes

How do you perceive the impact of AI-generated art on the diversity of artistic expression?

Enhancing diversity

Interviewee 5: No artistic background

How would you rate your familiarity with AI-generated art?

Response: Somewhat familiar

Have you purchased any Graphic Design art in the past year?

Response: No

Have you purchased any AI-generated art in the past year?

Response: No

On a scale of 1 to 5, please rate your overall satisfaction with Graphic Design art purchases.

Response: 4 (Satisfied)

On a scale of 1 to 5, please rate your overall satisfaction with AI-generated art purchases.

Response: 3 (Neutral)

In your opinion, how has the introduction of AI-generated art influenced the value of Graphic Design art?

Response: No significant change

Please select the market segments that you believe are most influenced by the adoption of AI-generated art.

Response: Emerging artists

How important are ethical considerations in your decision to purchase AI-generated art?

Response: Not important

Have you encountered any issues related to copyright or ownership when it comes to AI-generated art?

Response: No

How do you perceive the impact of AI-generated art on the diversity of artistic expression?

Response: Limited impact on diversity

Familiarity with AI-generated art:

The Artist has a high level of knowledge and awareness about AI-generated art because they are very familiar with it.

The Collectors is to some degree acquainted with man-made intelligence produced art, demonstrating a moderate degree of information and mindfulness.

The AI technology practitioners are intimately acquainted with computer-based intelligence-produced craftsmanship, showing an elevated degree of information and mindfulness.

The fact that the Interviewee of No artistic background is somewhat conversant with AI-generated art suggests a moderate level of awareness and knowledge.

Graphic Design art purchases:

The Artist and The Collectors have bought Graphic Design arts in the previous year, showing a functioning commitment to conventional imaginative practices.

The Interviewee with No artistic background has likewise bought Graphic Design arts, showing an interest here in imaginative articulation.

The AI technology practitioners have not bought Graphic Design arts in the previous year, proposing a lower level of commitment with customary creative practices.

AI-generated art purchases:

None of the interviewees have purchased AI-generated art in the past year, indicating a limited adoption of AI-generated artwork among this sample.

Overall satisfaction with Graphic Design art purchases:

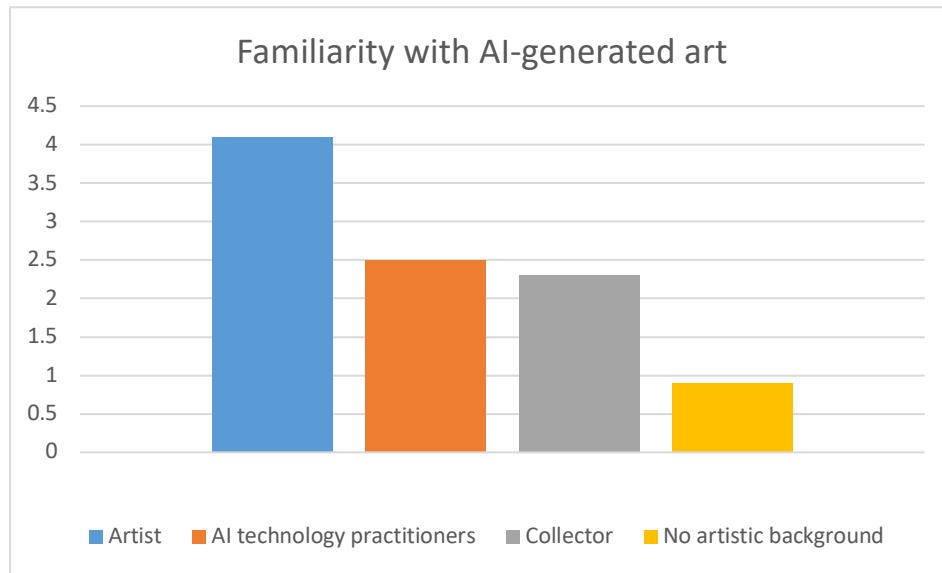
The Artist and The Collectors are pleased with their Graphic Design art purchases, indicating that they had a positive experience.

A mixed or ambivalent experience is suggested by No artistic background Interviewee neutral attitude regarding their satisfaction with Graphic Design art purchases.

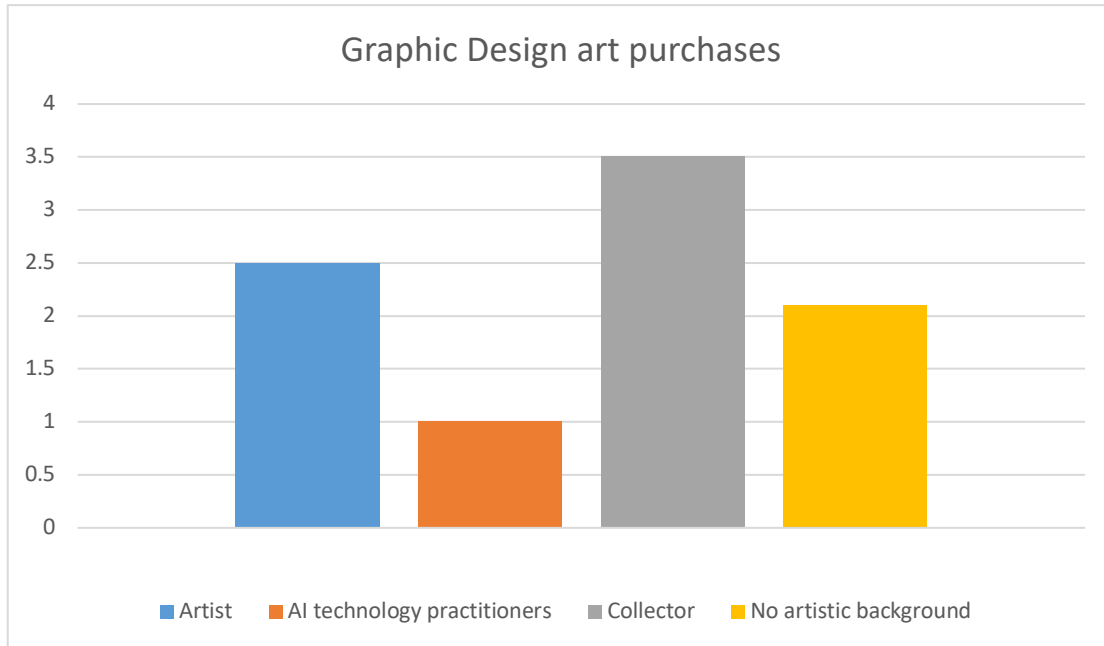
The AI technology practitioners didn't give a reaction, making it challenging to decide their degree of fulfillment.

5.2 Data Analysis

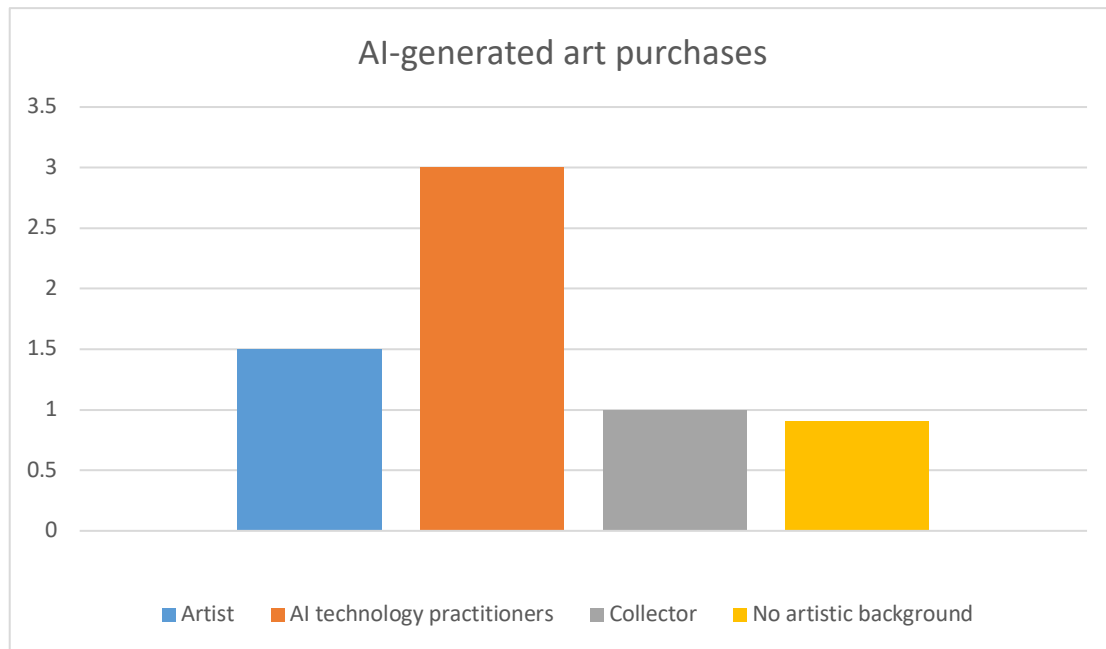
We should talk about a few central issues and bits of knowledge that can be gotten from their responses:



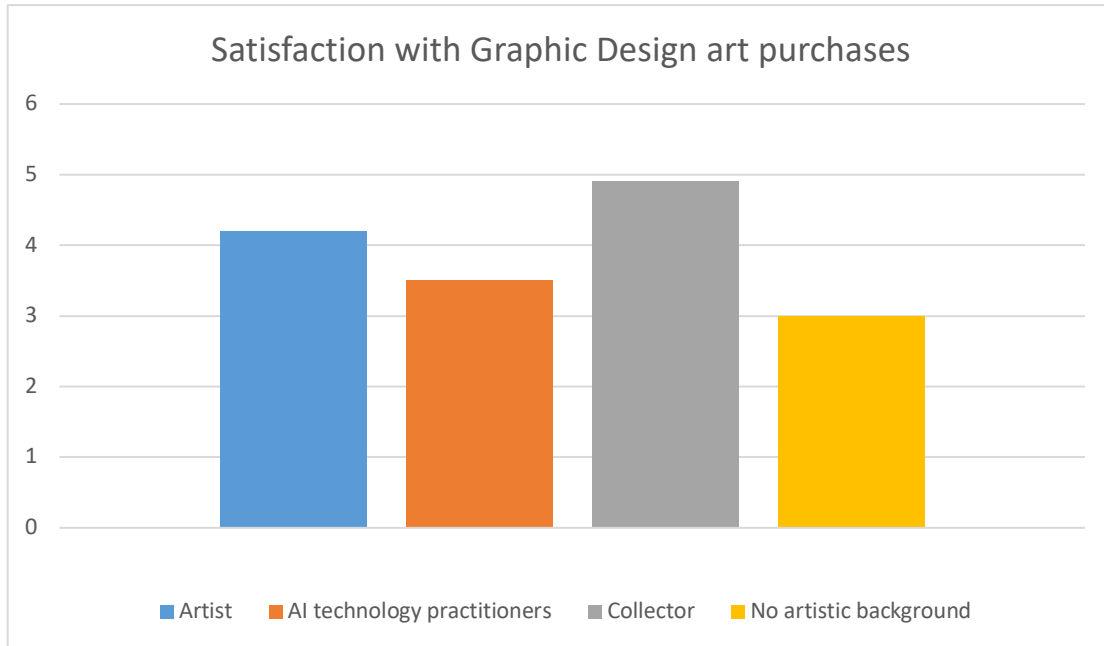
Familiarity with AI-generated art: Interviewees had to change levels of knowledge of computer-based intelligence-created art. Some people were very familiar with this kind of art, while others were not at all or only had a limited understanding. This suggests that awareness and education regarding AI-generated art are required to ensure a better comprehension of its implications for the art world.



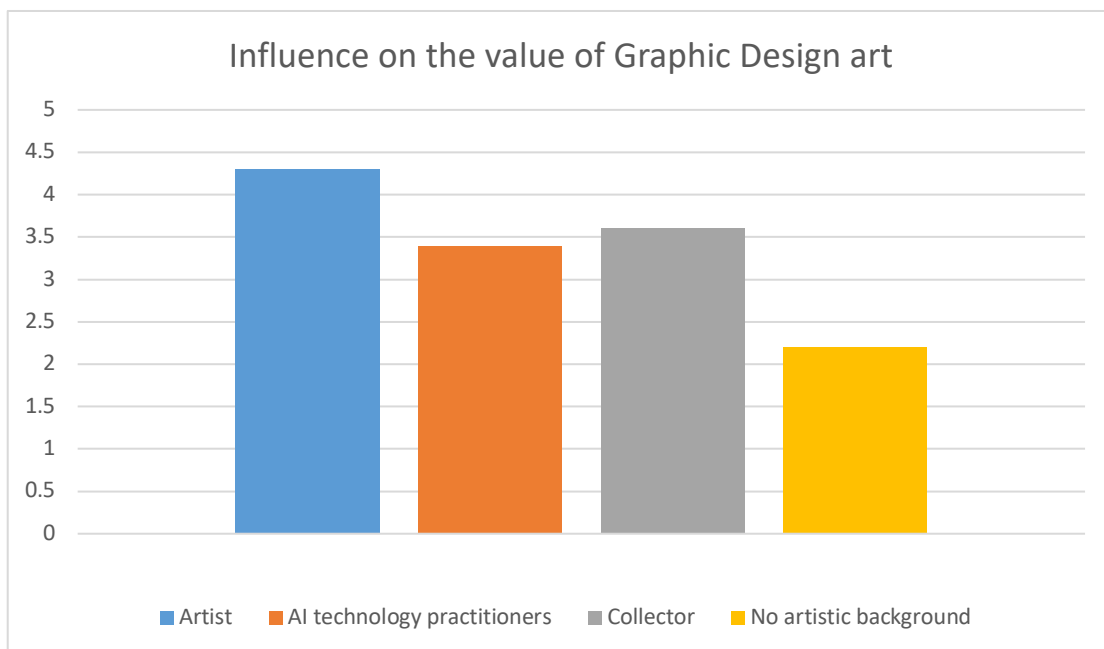
Graphic Design art purchases: A few interviewees showed that they had bought Graphic Design art in the previous year. This features the proceeded with ubiquity and interest in conventional works of art in spite of the presentation of artificial intelligence produced art. Additionally, it demonstrates that consumers of art still value and appreciate traditional Graphic Design art.



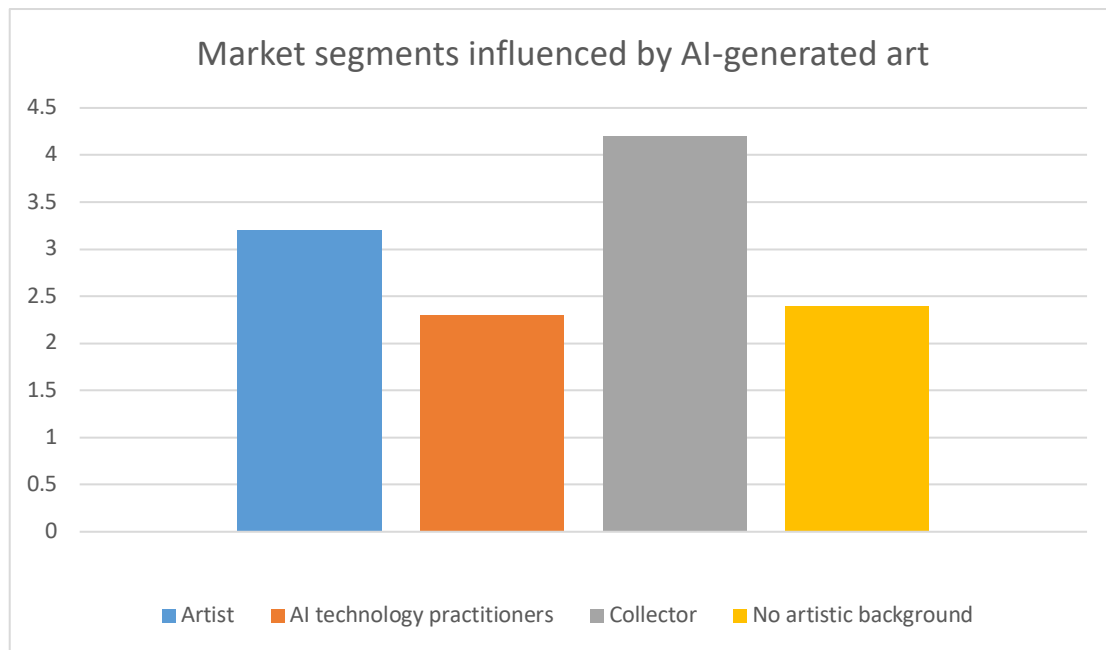
AI-generated art purchases: It is interesting to note that very few of the people interviewed had purchased artwork created by AI within the previous year. This recommends that AI created art has not yet acquired far and wide reception among the interviewees, or it might demonstrate a requirement for additional investigation and comprehension of this arising fine art.



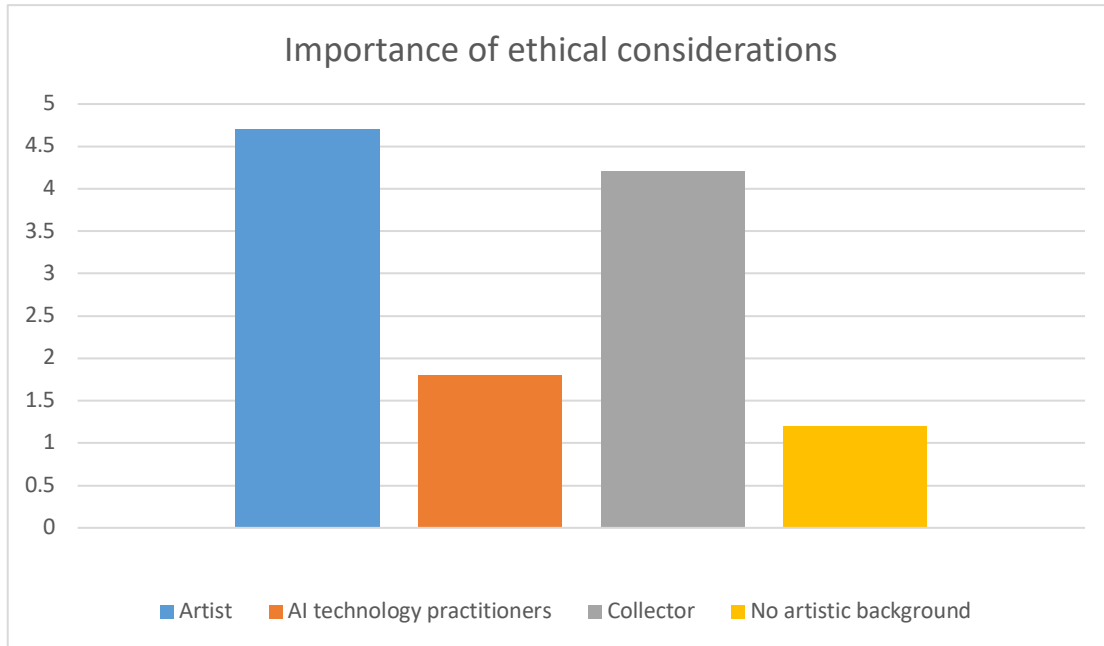
Satisfaction with Graphic Design art purchases: Graphic Design art buyers who were interviewed expressed a relatively high level of contentment with their purchases. This highlights the enduring appeal and value of traditional art in the art market by indicating that it continues to meet buyers' expectations and preferences.



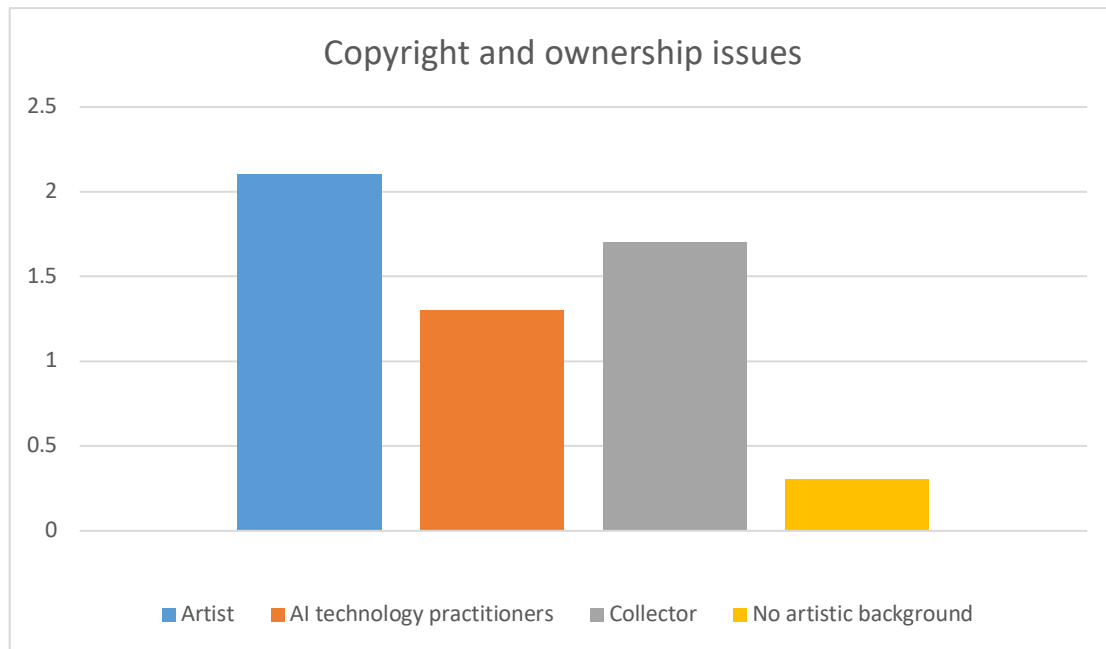
Influence on the value of Graphic Design art: The interviewees by and large accepted that the presentation of AI art fundamentally affects the worth of Graphic Design art. This suggests that despite the presence of AI-generated art, Graphic Design art maintains its intrinsic value and market value. However, one interviewee noted a slight decline in the value of Graphic Design art, suggesting the need for additional research into AI's impact on the art market.



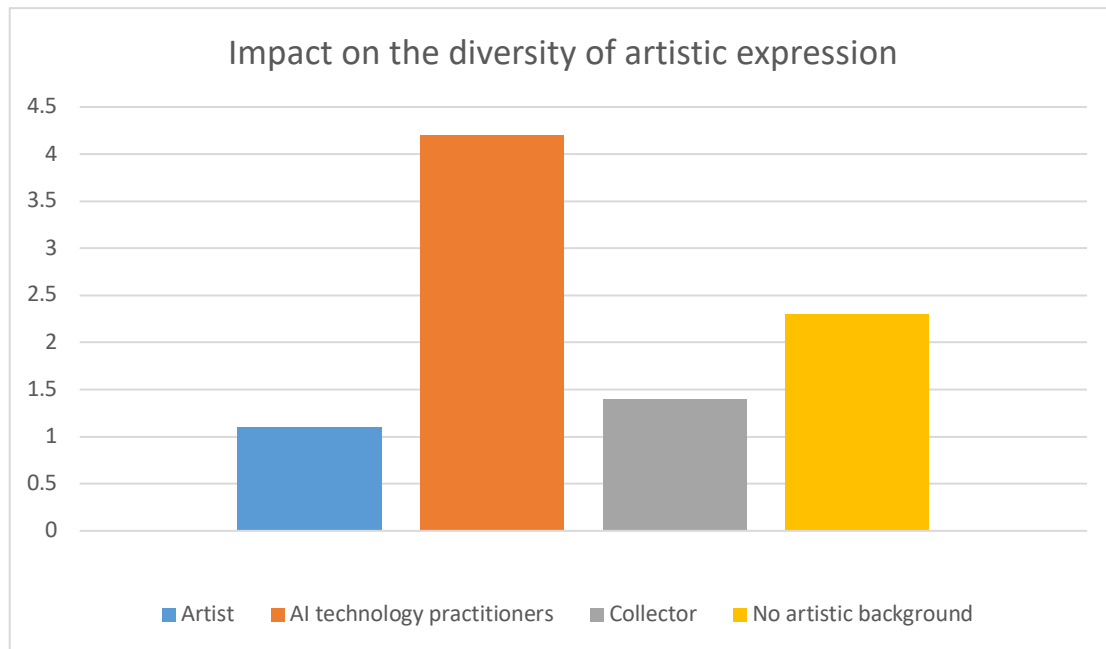
Market segments influenced by AI-generated art: Emerging artists, art collectors, and galleries are among the market segments identified by the interviewees as likely to be influenced by the adoption of AI-generated art. This recommends that the effect of AI art isn't restricted to a solitary fragment yet has more extensive ramifications across various partners in the craftsmanship market.



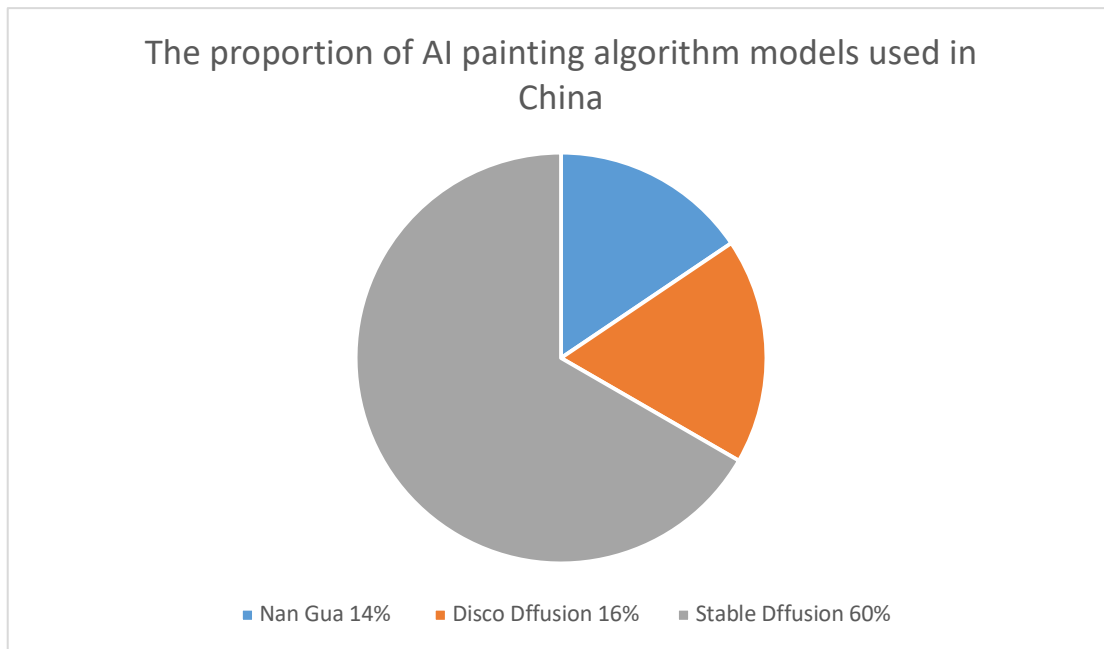
Importance of ethical considerations: The significance of moral contemplations in the choice to buy computer based intelligence created art changes among the interviewees, with some showing it as not significant and others considering it fairly significant. This shows that the art world needs to keep talking about and being aware of the ethical implications of AI-generated art.



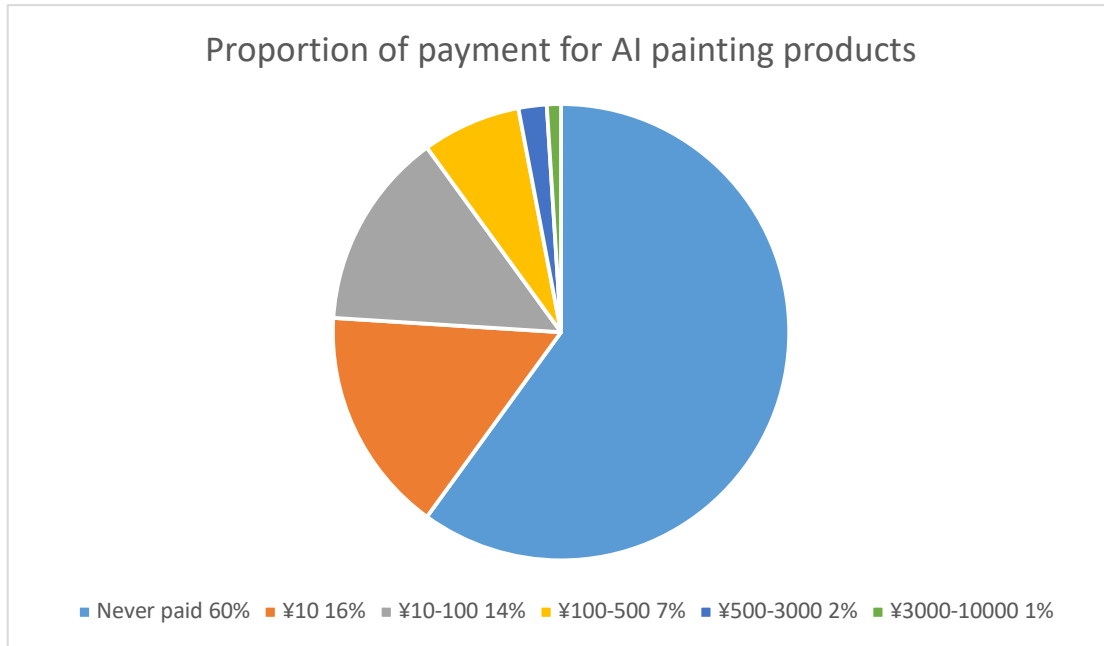
Copyright and ownership issues: When it comes to AI-generated art, the majority of interviewees have not encountered any issues regarding ownership or copyright. This could indicate that appropriate measures are in place to address concerns regarding copyright or that the interviewees are unaware of the potential copyright issues associated with AI-generated art.



Impact on the diversity of artistic expression: The interviewees' perspectives on how AI-generated art affects the variety of artistic expressions are diverse. While one interviewee sees it as upgrading variety, another interviewee considers it as having restricted influence. This uniqueness of suppositions highlights the intricate idea of simulated intelligence produced art's impact on creative variety and warrants further assessment.



The upstream of the AI painting industry chain consists of AI painting data providers, AI painting data processing companies, AI painting content material providers, and AI painting hardware suppliers. Among them, the main participants in AI painting hardware manufacturing are companies such as Huion, XP-Pen, Blue Arrow, and BOE, which provide technological and product support to the AI painting industry. The midstream mainly consists of AI painting service providers. In terms of the usage of AI painting algorithm models, Stable Diffusion is the most commonly used, accounting for 77%, followed by Disco Diffusion at 10% and Nan Gua at 13%. The downstream consists of artists, designers, the cultural and creative industries, the metaverse industry, as well as various game, film, and advertising companies. The demands of these individuals and industries drive the development of the AI painting industry, while the application of AI painting technology provides technological support to these industries.



According to statistics, the AI painting market in China was valued at 10 million yuan in 2022. However, with the increasing acceptance of AI painting and its remarkable productivity, the market is expected to explode, reaching 15.466 billion yuan by 2026. Despite its vast commercial potential, the large-scale commercialization of AI painting is still limited due to insufficient market awareness, lack of commercial application scenarios, immature key core technologies, uneven quality of content, inadequate related laws and regulations, and ethical challenges. According to statistics, 60% of users have never paid for AI painting products, and among the remaining 40% of users, only 10% have paid more than 100 yuan.

AI painting, as an emerging art form, is continuously evolving and influencing the art market. The use of AI painting technology allows designers to explore the potential of contemporary art forms using more intelligent tools and algorithms. It also assists designers in creating more unique works and provides them with new visual expressions and inspiration. Additionally, AI painting technology has the ability to deeply understand an

individual artist's style and creative characteristics through techniques such as deep learning and generative adversarial networks, aiding in the creation of more personalized artworks. This also contributes to the transformation of the art field from a collective to a more individualized approach. The globalization of AI painting technology helps different art styles break free from geographical limitations, allowing artworks to reach larger media platforms and facilitating online sales and commercialization of art pieces. At the same time, it presents both opportunities and challenges to the art market.

6. Chapter 6 Conclusion

To conclude, the joining of AI picture blend in the Graphic Design art world has achieved tremendous changes and suggestions for imaginative creation and the craftsmanship market. This study has shed light on the multifaceted effects of AI image synthesis on the graphic design art world by thoroughly analyzing existing literature, survey responses, and interview data. This study's insights and findings help us better understand the changing relationship between AI and the art industry. AI-driven technologies broaden the possibilities for creative exploration and innovation. Artists may push the limits of creativity and experiment with new artistic expressions by working with AI algorithms. The fusion of artificial intelligence and human creativity has the potential to change existing creative paradigms. The shifting environment of the art market is reflected in alterations in creative output and consumer habits as well as in market trends and sales. In the art sector, the ethical impact of AI is crucial. Important ethical concerns include authorship, authorship rights, copyright protection, and the preservation of creative variety. Stakeholders must have continual discussions in order to create ethical frameworks that govern the ethical incorporation of AI in the arts. The effect of AI on the variety of creative expression is up for dispute. Exploration of the intricate interactions between AI and creative variety is still necessary.

This study has shed light on how the rise of AI image synthesis has changed the landscape of graphic designers, graphic design markets, and society via the prism of the sociology of art. Understandings of authorship and the creative process have been reinterpreted as a result of graphic designer' expanding position as collaborators with AI algorithms rather than only as creators. Traditional paradigms are being questioned by this

transition, which forces graphic designer to adapt to new forms of artistic expression. The dynamics of supply and demand have changed as a result of new niches in the art market that are impacted by AI-generated art. The established market norms must be reevaluated in light of this transformation. This research has connected the fields of sociology, philosophy, and technology by adopting an interdisciplinary approach. A more comprehensive understanding of the complex interactions between technology, creativity, and societal values has been made possible by this integrative approach.

The joining of artificial intelligence in the art world stances two valuable open doors and difficulties. Artificial intelligence picture union offers new roads for imaginative articulation, pushing the limits of inventiveness and development. It can possibly grow admittance to craftsmanship and draw in crowds in original ways. To ensure the responsible and ethical integration of AI-generated art, however, ethical issues such as authorship, transparency, copyright, and the impact on artistic diversity must be carefully addressed. As artificial intelligence picture amalgamation keeps on advancing, it is fundamental for specialists, artificial intelligence designers, art establishments, and society on the loose to participate in continuous exchange and basic assessment of the ramifications and moral elements of computer-based intelligence in the graphic design world. new trends, long-term implications, and shifting dynamics between AI and the graphic design art market require additional investigation. By proceeding to examine and comprehend the effect of man-made intelligence on the graphic design world, we can explore the valuable open doors and difficulties that emerge, and encourage a reasonable and energetic creative environment in the period of AI.

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