

From Brushstrokes to Binary: The Impact of AI-Generated Art on Artists' Livelihoods

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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STS Research Paper

Artists Face the Digital Age

For generative artificial intelligence (AI), the canvas is not a blank space waiting for strokes of genius: it is a sequence of algorithms waiting for the perfect input. The traditional artist's palette is giving way to lines of code, and as AI-generated art continues to rapidly develop, many fear that the stroke of a key may begin to hold more weight than the stroke of a brush. Based on a survey of 504 Yale undergraduates, on average, respondents could tell if art was AI-generated or human-made 54% of the time (Yup, 2023). Machine-learning (ML)-based image generators have emerged in recent years to be able to generate art that is increasingly more difficult to distinguish from human-made art. With this powerful resource, many philosophical and ethical problems have been raised. This paper uses the Social Construction of Technology (SCOT) framework to answer and discuss the following questions: How does the sociotechnical nature of AI-generated art impact artists as a social group?

Examining AI-Generated Art and Artists

How does the socio-technical nature of AI-generated art impact artists as a social group?

While AI-generated art offers unprecedented tools for innovation and experimentation, it also raises concerns about its effects on the existing art industry. To address the question, this paper uses documentary analysis and discourse analysis to examine sources on artists' views and fears about AI-generated art and bias towards human art as opposed to AI art and how that may affect the future of the art industry. Twitter posts, blog posts, and journalism related to generative art will be analyzed to gain a broader perspective on varying social perspectives on the topic of generative AI. To shed light on the economic impact of AI on artists, this paper examines

generative AI shares in the art market size, value, and projections. By employing documentary and discourse analysis, a comprehensive understanding of the effects of AI-generated art on artists and their livelihoods can be achieved.

Lawsuits Against Generative Art

AI has emerged as a transformative force in the world of art, challenging conventional notions of creativity and pushing the boundaries of artistic expression. AI-generated art, produced by algorithms and neural networks, encompasses a diverse range of styles and mediums, from paintings and sculptures to music and poetry. The sophisticated systems are trained on vast datasets of existing artwork to analyze patterns, styles, and compositions to generate new pieces autonomously. One notable example is DALL-E, developed by OpenAI, which generates unique images from textual descriptions using a large dataset of diverse visual concepts (DALL-E 3, 2024). These AI art generators operate by leveraging generative adversarial networks (GANs), recurrent neural networks (RNNs), and other machine learning techniques to learn the aesthetic principles underlying various art styles and genres. By analyzing vast collections of artworks, the models develop an understanding of color palettes, brush strokes, and compositional elements, allowing them to create original pieces that mimic the styles of artists or explore entirely new aesthetic territories. However, the rise of AI-generated art has also raised legal and ethical questions regarding intellectual property rights and artistic authenticity.

In the realm of AI-generated art, controversies have arisen over the use of copyrighted artworks in the datasets the algorithms are trained on and the ownership and copyright of artworks created by algorithms. In January 2023, three artists launched a class-action lawsuit against Midjourney, Stable Diffusion, and DreamUp based on “the three ‘C’s”:

compensation, and credit (Chayka, 2023). Most AI art generators use LAION, an open access database that includes over five billion images from the Internet, including the work of many artists, but the many artists have not consented to have their artwork included in the database. In October 2023, US District Judge William Orrick dismissed parts of the lawsuit, finding that the AI outputs do not infringe on the artists' copyrights because the artists' works had either not been registered for copyright, or the artists could not provide a specific list of works the models have been trained on (Brittain, 2023). However, in the following month, the lawsuit was amended with seven more artists, and Franzen (2023) lists the artists' updated complaints:

1. The artists' non-copyrighted works may be automatically eligible for copyright protections if they include a distinctive mark.
2. AI companies had to download "unauthorized copies" of their artworks from LAION as the database only contains links to the copyrighted works.
3. The nature of how models generate images is designed to replicate the initial training material as closely as possible.

The lawsuit among many others illustrates the complex legal and ethical implications of AI-generated art, raising questions about authorship, ownership, and the commodification of digital creativity.

There have been some responses from the companies behind AI art generators to lawsuits and concerns among artists: DALL-E 3 (2024) explicitly claims on their website that images created with the AI can be freely reprinted, sold, or merchandised, and they claim that some level of protection for artists is embedded in their AI:

DALL-E is designed to decline requests that ask for an image in the style of a living artist. Creators can now also opt their images out from training of our future image generation models.

Stability AI has also given artists a means to opt out of having their images train future models (Stability AI, 2022). However, there are ways to implicitly get the AI to generate art in the style of these artists using keywords related to their style, and artists are not receiving compensation for their art that has already been used to train existing art generators nor the AI-generated art being commercialized using the artists' names as keywords. Additionally, there are model trainers that disregard copyrights, opt-out lists, and do-not-scrape directives altogether. As AI continues to reshape the landscape of artistic production, addressing these challenges will be essential to ensure the integrity and sustainability of the art world in the digital age.

SCOT Framework and AI

The SCOT framework provides a lens through which to examine the complex interplay between AI-generated art and its societal impacts, particularly concerning artists and their livelihoods. With leading advocates Wiebe Bijker and Trevor Pinch, SCOT emphasizes the dynamic relationship between technology and society, highlighting how technological artifacts are not predetermined but shaped by social processes, values, and power dynamics (1984). The SCOT framework has been employed by various researchers across different domains to explore the interplay between technology and society. In examining topics related to AI, several authors have utilized SCOT to investigate how technological artifacts are shaped by social processes, user interactions, and interpretive flexibility.

Before the emergence of ChatGPT, many feared that the information worldwide as we know it would be maliciously manipulated with misinformation via deepfake, a form of media manipulation emerging from the advancement of digital imaging through GANs. Kwok (2020) discusses the advancement of deepfake and “its potential impact on tourism,” redressing its purpose through the lens of SCOT. Kwok focuses not on whether deepfake/GANs is “a good or bad technology, but to debate the potential positive application and regulation of deepfake,” and this is a sentiment to be applied to the advancements in generative AI art. Generative AI is here to stay, so it is no longer a matter of whether AI-generated art is good or bad, but how multiple user groups can positively define the trajectory of technological development and regulate AI-generated art.

Obreja (2023) writes about the moral status of artificial intelligence with regards to Google’s language model, LaMDA, and they refer to a definition of a “black box” which “is a part of science that is universally accepted so that it is no longer controversial.” Obreja found it useful to use SCOT and interpretive flexibility to analyze LaMDA with a black box because it was not a technology implemented at the societal level, so they were able to “make sense of and create different expectations for future technology.” Just as LaMDA represents a complex technology with opaque inner workings, AI-art generators can also be seen as black boxes in terms of their algorithms and processes. While LaMDA was not implemented at the societal level at the time of Obreja's analysis, AI-art generators are increasingly integrated into various aspects of the art industry and broader society. This difference may influence the dynamics of interpretive flexibility and the negotiation of meanings surrounding AI-generated art, as it becomes more embedded in artistic practices, markets, and cultural discourse.

By adopting a SCOT lens, the adoption and use of AI-generated art influenced by social, cultural, and economic factors, shedding light on the diverse perspectives and interests at play can be explored. Moreover, this paper investigates how interpretive flexibility shapes the evolution of AI-generated art, considering both the potential benefits and challenges posed by technological innovation. Within the SCOT framework, the development and commercialization of AI-generated art are deeply intertwined with the actions and agendas of various social actors, including technology developers, commercial entities, personal users, and artists themselves. By analyzing the social construction of AI-generated art through the lens of the SCOT framework, we can gain a nuanced understanding of the complex interactions and negotiations that shape the development, adoption, and impact of AI technologies in the artistic domain. This perspective highlights the importance of considering the diverse perspectives, interests, and values of stakeholders in navigating the ethical, legal, and cultural implications of AI-generated art in the digital age.

Artists' Precarious Position

The integration of AI into the realm of artistic creation has sparked apprehension within the art community. While some artists are open to integrating AI into their own work or see generative art as an opportunity for growth, many artists fear being replaced by art generators because artists are not recognized for their influence on the outputs of AI art generators and artists' styles are being plagiarized. Artists must tackle oversaturation in the art market as well as compete with art generators that often satisfy the needs of their would-be clients. As it stands, artists may lose billions of dollars and struggle to stand out in the art market, even if negative bias exists surrounding AI-generated art.

Artists' Perceptions and Challenges

Artists' creative practices, values, and livelihoods are deeply intertwined with the emergence and evolution of AI-generated art. For artists, the adoption of AI tools presents both opportunities and challenges, as it offers new avenues for experimentation, collaboration, and expression, but also raises questions about authorship, originality, and artistic agency.

Artists' perceptions of generative art encompass a spectrum of attitudes ranging from curiosity and excitement to skepticism and apprehension. Greg Rutkowski is a Polish digital artist whose name has been used over 100,000 times as one of the most used prompts in generating fantasy landscapes. Originally, he thought it might be a good way to reach new audiences. He found when searching his name, the results showed work with his name attached. However, many of these results were not his original work. He fears that with time, the search results from querying his name will be so saturated with AI-generated art that it will be increasingly difficult to find his original art (Heikkila, 2022). Although artists' names are gaining exposure as prompts for generative art, the exposure is surface level and not tied to their original art, and many generative art users do not explore the names they use as keywords beyond serving their purpose.

For many artists, particularly those immersed in traditional mediums, the emergence of generative art represents both a source of inspiration and a potential disruption to established artistic practices. Brennan Buck, a senior critic at the Yale School of Architecture and practicing architect, claims, "It's not that it is or will replace human creativity but that it will change how humans are creative and how art is produced," (Yup, 2023). Some artists view generative art as a tool for exploration and experimentation, offering new avenues for creative expression and pushing the boundaries of traditional aesthetics. These artists may embrace generative algorithms

as collaborators, leveraging their capabilities to generate novel ideas, textures, and forms that may not be achievable through manual means alone.

However, alongside its promise, generative art also presents a host of challenges and complexities for artists. One of the primary concerns is the perceived threat to artistic autonomy and authorship. Traditional notions of artistic practice emphasize the role of the individual artist as the sole creator and arbiter of their work. In contrast, generative algorithms blur the lines between human agency and machine intelligence, raising questions about who owns the creative output and who deserves credit for its production. Artists may grapple with feelings of displacement or insecurity as they navigate the shifting landscape of artistic production, where algorithms wield increasing influence over the creation and dissemination of art.

Artists also face technical and conceptual challenges in integrating generative techniques into their practice. Artists may have to discover how they can integrate AI into their artwork, and that process may come with a steep learning curve, especially if they only work with traditional art mediums. Moreover, artists must contend with questions of aesthetic judgment and artistic intent when employing generative algorithms. The unpredictable nature of algorithmic output can lead to issues of control and interpretation, as artists strive to balance the serendipitous discoveries enabled by generative processes with their own artistic vision and intentionality.

Generative art raises ethical considerations regarding the use of data, bias, and algorithmic accountability. Artists must grapple with questions of data privacy, consent, and ownership when employing generative art in their creative process. Moreover, the potential for bias and discrimination embedded within algorithms poses significant challenges for artists seeking to create inclusive and socially conscious art. As artists confront these complex ethical dilemmas, they must navigate the tension between technological innovation and ethical

responsibility, striving to create art that is both innovative and ethically grounded. Overall, artists' perceptions of generative art reflect a complex interplay of excitement, uncertainty, and ambivalence as they navigate the evolving landscape of artistic practice in the digital age.

Bias Towards Human Art Versus AI Art

Bias towards human art versus AI art reflects broader societal attitudes, preferences, and perceptions surrounding artistic creation and authenticity. Human art, rooted in centuries of tradition and cultural heritage, is often seen as a manifestation of individual creativity, skill, and emotion. Artworks created by human hands evoke a sense of connection and intimacy, imbued with the artist's personal experiences and perspectives. As a result, human art is often celebrated for its uniqueness, originality, and emotional resonance, which can be valued not only for its aesthetic qualities but also for its historical and cultural significance.

There is growing recognition of the unique potential of AI art to expand the boundaries of artistic expression and challenge prevailing notions of creativity. A study found that participants who considered that new technologies helped them feel related to others were generally more positive about AI in art, but overall, opinions of AI in art were polarizing (Latikka et al., 2023). Generative algorithms offer artists new tools for experimentation and exploration, enabling them to create artworks that push the limits of traditional aesthetics and defy conventional categorizations. Moreover, AI art has the capacity to democratize access to artistic creation, providing opportunities for individuals from diverse backgrounds to engage with and participate in the creative process.

In contrast, AI art is often met with skepticism, viewed as derivative, or lacking in genuine artistic merit. Critics argue that AI-generated artworks lack the soulfulness and depth of

human expression, dismissing them as mere simulations or imitations of human creativity. Studies show that people are more likely to hold positive judgements about human-labelled art than AI-labelled art even if the art is AI-generated (Bellaiche et al., 2023). Hong and Curran (2019) found that human-created artworks and AI-created artworks were not judged to be equivalent in artistic value and knowing that an artwork was AI-generated did not influence peoples' evaluation. The perceived lack of intentionality and subjectivity in AI-generated art contributes to its devaluation within the art world, with some questioning whether algorithms can truly possess the capacity for creativity or aesthetic judgment. Therefore, artists may not have to be concerned about devaluation of their artwork because the effort put into their artwork is inherently valued and judged more highly than that of AI art.

Although people tend to hold more value in human-generated art over AI-generated art, findings suggest that people are not always able to recognize AI-generated art or differentiate it from human-generated art (Yup, 2023). Stability AI CEO Emad Mosque has claimed that artists want to have “a monopoly on visual communications” and “skill segregation” (Crabapple, 2023). Stability is one of the leading AI art generators, and as a developer of generative art, they play a pivotal role in shaping the design, functionality, and accessibility of AI art. The technology developers, whether from academic institutions, research labs, or private companies, are responsible for creating the algorithms, models, and platforms that enable users to generate and manipulate art through machine learning techniques. Their decisions regarding data selection and algorithm design influence the capabilities and limitations of AI art generators, thereby shaping the artistic possibilities available to users. Not only do they want art to be more accessible, but they also want to break down the barriers to entry into the art market. As more users utilize their services, the more their generative art improves and the more profit they stand to gain.

Economic Impact

The rise of AI-generated art has introduced significant shifts in the economic landscape of the art industry, posing both opportunities and challenges for artists and market dynamics alike. While artists have spent years perfecting their styles, AI-art generators are using the works of many of these artists without compensation or recognition “while raising billions from venture capitalists to compete with them in the same market” (Jiang et al., 2023). This potential for generative AI companies to significantly capitalize on training on artists’ original work underscores the ethical concerns surrounding the ownership and appropriation of artistic content in the digital age. “Although many images do not have the full depth of expression of a human, commercial image generators flood the market with acceptable imagery that can supplant the demand for artists in practice,” (Jiang et al., 2023). While artists traditionally rely on their unique styles to distinguish themselves in the market, the proliferation of AI-generated art threatens to commodify and dilute the value of their original works. Moreover, the influx of AI-generated art flooding the market raises questions about the sustainability of artists’ livelihoods as commercial image generators vie for market share and potentially supplant the demand for human artists.

The economic impact of AI art extends beyond the exploitation of artists’ works to encompass broader market dynamics. In 2022, generative AI in the art market was worth 212 million dollars, but generative AI in the art market is projected to grow at a compound annual growth rate of 40.5% to be worth 5.840 billion dollars in 2032 (Generative AI in Art Market, 2023). The exponential growth signals a massive transformation in the structure and valuation of the art industry: AI art is poised to become a formidable player in the art market. This growth trajectory suggests a reshaping of consumer preferences and revenue streams within the art industry as AI-generated art gains traction as a viable asset.

While AI-generated art may offer new avenues for innovation and accessibility, its rapid proliferation raises concerns about market saturation, quality control, and artistic authenticity. As commercial image generators flood the market with vast quantities of acceptable imagery, there is a risk of undermining the diversity and depth of human creativity. The dominance of AI-generated art in the market may exacerbate inequalities within the art ecosystem, privileging those with access to sophisticated AI tools and technical expertise while marginalizing artists who rely on traditional mediums or lack the resources to compete in the digital realm.

Balancing Artists' Rights and Technological Integration

This paper has delved into the intricate socio-technical dynamics surrounding AI-generated art and its profound implications for artists and the art industry. Through an analysis of artists' perceptions, economic impacts, and biases towards human versus AI art, we have uncovered the multifaceted challenges and opportunities that arise from the integration of AI into artistic practice. From concerns about artistic autonomy and authorship to the economic implications of market saturation and commodification, artists are navigating a rapidly evolving landscape that demands critical reflection and adaptation.

However, it is worth noting that this paper has not addressed the strategies employed by some artists to safeguard their creative autonomy in the face of AI-generated art. Some artists have turned to techniques such as "poisoning" their artwork to disrupt generative art models and prevent their original creations from being used to train AI algorithms without their consent (Nightshade: Protecting Copyright, 2024). By embedding subtle imperfections or distortions into their artwork, artists can disrupt the training process and protect their intellectual property rights. The "poisoning" of artwork to disrupt generative art models raises important ethical questions

about the balance between artistic innovation and technological manipulation, which warrants further exploration in future research.

Moving forward, future research in this field should aim to delve deeper into the ethical, legal, and cultural implications of AI-generated art, with a particular focus on the agency and rights of artists. Additionally, investigating the potential for collaborative frameworks between artists and AI technologies could yield valuable insights into new modes of creative expression and cultural production. By fostering dialogue and collaboration between artists, technologists, policymakers, and other stakeholders, we can work towards a more equitable and sustainable future for artistic practice in the digital age.

In summary, the socio-technical nature of AI-generated art has a profound impact on artists as a social group, shaping their perceptions, livelihoods, and creative practices. While AI offers unprecedented tools for innovation and accessibility, it also poses significant challenges to artistic autonomy, economic sustainability, and cultural diversity. By interrogating these complex dynamics, we can strive towards a more inclusive and ethically grounded approach to artistic creation that honors the rich diversity of human creativity while embracing the transformative potential of technology.

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