

# **Machines Making Art: How Can Artists Protect Their Art from Generative AI?**

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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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## Introduction

In 2022, generative artificial intelligence (AI) art angered the internet when an image generated via AI system Midjourney won the grand prize for the Colorado State Fair’s fine arts competition. Amid severe backlash from artists, the image’s creator, Jason Allen, denied any wrongdoing, arguing he had disclosed it was AI and had submitted the piece under the name “Jason M. Allen via Midjourney.” The Fair defended its decision and Allen’s usage of AI. (Roose, 2022, paras. 3-21).

Allen’s win sparked widespread interest in AI generated art, awareness of which has exploded in recent years. Generative AI is commonly an interface which prompts users for input and generates text, like ChatGPT, or images, like Midjourney, DALL-E, or Stable Diffusion. Images generated via these systems, then, are often called “AI art.” While some herald AI art as an equalizer in the artistic field, many artists disagree. A history of human-machine conflict supports them alongside ethical issues concerning AI and algorithms in general. In this paper, I argue that AI art is a dangerous competitor to artists that infringes on their intellectual property and I investigate tools available to protect them.

To research AI art and its impact on artists, I leveraged prior knowledge on the topic and recorded recent developments in the news. My goal was to gain an understanding of each party active in the field today and to highlight historical ethical concerns around artificial intelligence and technology. Throughout this process, I gathered and documented sources describing what I previously knew, including news articles and the websites for popular anti-AI art software. I supplemented this prior knowledge with additional research in journals and news websites, using keywords such as “AI art,” “copyright,” and the names of various AI art generators and artists I knew to be involved. With this information, I synthesized an Actor Network Theory model to

analyze interested parties and their interactions, which determined relevant questions to discuss. Because Actor Network Theory excels at dissecting the interactions between certain parties in an evolving field, I believe it is an appropriate choice of framework for a topic with such distinct actors.

The following section opens with historical conflicts regarding machinery in the workplace, which includes recent social issues perpetuated by algorithms and the ethical and legal concerns about AI art itself. The second section discusses the interested parties and issues using an Actor Network Theory analysis. Discussion of the ANT analysis leads into the next section: an exploration of the tools, both technological and legal, that artists can use to protect themselves in the United States. Finally, I weigh the tools against the threats and judge that, while the current situation is precarious and subject to change, recent technologies and policy decisions may signify hope for artists.

## **Problems and Background**

Fears that artists have regarding replacement by generative AI echo past sentiments about machines replacing human labor. Recent concerns include the jobs of cashiers and service workers being lost to self-checkout stations and digital ordering interfaces, but the human-machine conflict has a long history. In Karl Marx's criticism of capitalism, he describes the tension between workers and new technologies: "In the 17th century nearly all Europe experienced revolts of the workpeople against the ribbon-loom, a machine for weaving ribbons and trimmings..." (Marx, 1867, p. 263). Workers protested the introduction of a machine they worried would replace them, much like artists are doing today.

However, by today's standards, many historical occupations were simple, repetitive tasks that were easily replicated via machine. A common argument regarding such jobs is that with increasing automation, human workers will be free to perform more fulfilling jobs and hobbies. This may have been true historically, but as technology becomes more complex, the labor it can perform shifts from menial, repeated tasks to more complicated ones. The development of algorithms and AI created new social issues that society must contend with in addition to this human-machine conflict.

### *Social Issues Regarding Algorithms and AI*

In an ideal world, technology would be free of society's biases; in practice, it is not inherently neutral and absorbs the prejudice society wields against marginalized communities. In her book about the racism underlying search algorithms, Safiya Umoja Noble states, "...algorithms are a fundamental invention of computer scientists who are human beings—and code is a language full of meaning..." (2018, p. 26). Despite the supposed neutrality of algorithms, technology does not always treat social groups with equity. Machine learning (ML) relies on a training dataset to teach the algorithm how to behave. ML algorithms generally perform better when given large amounts of data to train on. However, these large datasets often reflect societal biases, and the algorithms perform worse on groups underrepresented in the training sets. Facial recognition technology trained on predominantly male faces is less likely to function given women's faces, while a soap dispenser calibrated for light skin is unlikely to activate for a darker-skinned user.

Technology goes beyond underserving minority groups, sometimes causing them active harm. Noble describes a meeting she attended with journalist Julia Angwin, who investigated a courtroom sentencing software called Northpointe. "...this type of artificial intelligence," she

relays, “miserably mispredicted future criminal activity and led to the overincarceration of Black defendants,” (Noble, 2018, p. 27). Northpointe predicted a far lower rate of recidivism for white criminals than their African American counterparts, which is reflected in harmful stereotypes of the Black community, but not the data. The harm ML can cause to minorities also extends to physical harm. Datasets for motion-capture technology, which are being used in AI algorithms for self-driving vehicles and fall-detection systems, depict only a small fraction of human bodies: often male, white, non-disabled, and thin (Pepitone, 2024, para. 9). Systems that do not account for all bodies lead to dangerous conditions for those they ignore, and the companies maintaining these widely used algorithms have no motivation to correct them until complaints are raised. Companies that try to address bias in their algorithms often cannot due to how deeply entrenched these biases are in the training data.

Generative AI, being a subset of ML, echoes its social issues. Large language models (LLMs), for example, train on corpora of text scraped from the web. Because the internet is unfiltered, LLMs absorb its prejudices, which can later be outputted to users. LLMs additionally concern writers in much the same way that AI art generators concern artists; writers worry they may be replaced. During the 2023 Writers Guild of America (WGA) strike, writers feared their writers’ rooms would be eliminated in favor of companies employing LLMs, such as the newly released ChatGPT. While addressing AI was not their primary goal, “the threat of AI vividly cast the writers’ plight as a human-versus-machine clash” and “became an existential rallying cry,” (Coyle, 2023, paras. 2-3). LLMs such as ChatGPT are contentious not only for their ability to replace writers, but for how they train. In addition to the previously discussed biases present in AI training data, companies sourcing texts from the internet makes it unlikely that they obtained the copyrights to each piece a model trained on. Not only does this make the copyright of an

LLM's output nebulous at best, but it is also possible that writers must compete against distorted versions of their own works. The issues with LLMs mirror the problems that artists are facing with generative AI art.

### *The Problems with AI Art Generators*

Generative AI art, in addition to its own problems, inherits the same social issues that LLMs do from ML. Training data provided to AI art companies is often obtained from mainly North American and European sources, teaching art generators Western biases. Stable Diffusion, even after an update to reduce bias in 2023, generated images that perpetuate negative stereotypes of minority groups, depicting portraits of “a person cleaning” as overwhelmingly female, and portraits of “a person at social services” as largely Black (Tiku et. al, 2023, paras. 16-27). Some companies attempted to mitigate bias by removing offensive images or tags from training data, while others, such as Google, injected false diversity into their output. Google's Gemini received criticism when a user of X (formerly Twitter) posted images Gemini had generated of a “1943 German Solidier [*sic*],” which included people of color in Nazi uniforms (Grant, 2024, para. 4). These attempts at falsifying diversity do not reflect the real world and are only temporarily bandaging a systemic problem.

Image generators pose an additional threat: their ease of access and the convincing nature of their output provide fertile ground for disinformation and deepfakes, forged images or videos that appear to depict some target. Users can then weaponize falsified imagery against an individual or group, manipulating public perception of said target. This is only exacerbated by the prejudiced nature of AI art generators; users may mislead others unintentionally with biased images. Deepfakes can also undermine legitimate news sources by corroding public trust, “creating doubts about any information encountered,” (Bontridder & Pouillet, 2021, p. 4).

Especially with formal regulations in their infancy, image generators driven by AI have a dangerous capacity for altering the opinions of the public.

Like writers and LLMs, a major concern of artists is being replaced by generative AI. AI art generators range in price but remain vastly cheaper than hiring a professional artist. Some artists make a significant portion of their income from the internet and are now competing for commissions given the prevalence of AI art. Insidiously, these would-be clients are able to simulate ordering a commission from a given artist by entering the artist's name as part of their input, prompting the generator to mimic said artist's style. This style mimicry is especially effective if the artist's work has been included in the model's training data, which is often the case. Stable Diffusion, created by Stability AI, trained on a subset of the LAION-5B dataset, which is a "massive cache of images and text from the internet," (Metz, 2022, para. 13). Each image is linked to a set of keywords, which trains the model to associate words with images so it can generate art that matches user demands.

Midjourney is also transparent about sourcing their images from published datasets on the internet. When asked whether Midjourney obtained consent from artists in the training set, its founder and CEO, David Holz, replied in an interview, "No. There isn't really a way to get a hundred million images and know where they're coming from," (Salkowitz, 2022, para. 13). Despite being aware of artistic copyright and acknowledging the difficulty of respecting it, Midjourney chose to ignore it, allowing their generator to output images of questionable copyright. Regardless, later in the interview, Holz explains that users are permitted to use images generated by Midjourney in commercial contexts, only requiring a corporate license once they surpass one million dollars in annual revenue (Salkowitz, 2022, para. 11). Midjourney openly

profits from the work of artists who are unable to consent and cannot be credited or compensated. This lack of compensation to artists is common practice for AI image generators.

However, a minority of artists endorse or even use AI art generators in their creative processes, arguing that AI art is democratizing, allows more people to be creative, and speeds up the artistic workflow. One argument AI supporters employ is that an AI art generator is a tool akin to a camera, thus likening the creation of AI images to photography. The image generator, then, is merely a tool, with its user as an artist. However, generating AI images does not involve the artistic process as photography or other arts do. The user of generative AI is not the photographer, who must find an ideal composition, lighting, and focus. They are instead the commissioner, specifying to a third party the type of image they would like to receive. Given that said third party is an algorithm unable to have a creative process and generates images from real artists' works, the drawbacks discussed previously massively outweigh what AI can offer most artists.

### **Actor Network Theory Analysis**

Due to the emergent nature of generative AI technology, I decided an Actor Network Theory (ANT) analysis would be helpful in investigating related factors and interested parties. ANT posits that any interaction consists of parties (which may or may not be human) called actors influencing each other within a series of networks (Sismondo, 2010, p. 81). I propose the following ANT network and briefly describe each of the actors and their goals in the following subsections.

#### *I. Artists*



Artists are directly affected by AI art. Many artists use the internet to pursue a hobby or career; some may make substantial income online through personal commission work or websites such as Patreon. However, by posting their works online, artists are at risk of having their art scraped as training data for AI art generators, which then become direct competition to them. While a minority of artists embrace AI art, the wider attitude is one of concern. Professional artist Daniel Danger worries “the images people produce with AI image generators could replace some of his more ‘utilitarian’ work,” referring to media such as book covers and article illustrations (Metz, 2022, para. 19). Thus, the goals of artists within the ANT framework are to maintain copyright of their works and be free of competition from generative AI.

## *II. AI Art Generators*

Artists are in conflict with AI art generators and the companies that create them. For the purposes of this analysis, I combine generators and their respective companies into a single generic actor. The goal of this actor is to expand the usage of AI art generators among the public and throughout industry. By increasing exposure to artificially generated works, these companies can legitimize AI art, establishing themselves in the process. Many AI companies also offer subscription services or otherwise implement paywalls. By expanding their user base, these companies would raise their profits.

## *III. Artistic Customers*

The patrons that both artists and generative AI companies are trying to attract comprise a third actor, who I describe here as artistic customers. Artistic customers range from large companies helming professional productions to lay people in search of personal art. Some have ethical objections to AI art and seek out professional artists, but others have no such qualms. Both lay people and large companies are influenced by cost. AI art generators, while often

having paid models, still cost less than hiring an artist or team. Instead of hiring a background artist for its animated short film “The Dog & The Boy,” Netflix employed AI art and credited the artist who edited the output as “Human.” (Cole, 2023, para. 6). Netflix, in paying this artist to edit an artificially generated piece, was likely able to save substantial money over paying the artist to create the full backgrounds. The artistic customer’s goal is to procure art of a satisfactory quality at an affordable price.

#### *IV. Defensive Artistic Technology*

Since AI art has begun proliferating, artists and their allies have been creating technologies meant to defend against it, which I describe as defensive artistic technology. Defensive artistic technology can include AI art detection services, anti-AI filters for artworks, or databases where artists can find whether or not their work has been scraped. While they are not always developed by artists, these tools are generally created for them, and in contrast to AI art generators, are usually free to use. The goal of defensive artistic technology is to protect artists by hindering AI art. These tools seek to further the artists’ goals of protecting their copyright and also direct more artistic customers away from AI. Defensive artistic technology is one of the two main potential deterrents to AI art patronage.

#### *V. U.S. Government*

The second deterrent is copyright law in the United States. Because AI art is still fairly young, established precedent on the topic is lacking. However, courts have begun addressing artists’ lawsuits and the U.S. Copyright Office recently contended with whether or not to grant copyright to AI art. It remains to be seen whether future legislation will further aid artists or generative AI companies. The goal of the Copyright Office and related government entities is, generally, to make the fairest rulings possible to the public.

Within an ANT analysis, the obligatory passage point (OPP) is an interaction in the network that most of the actors rely or depend on. In this network, the artists and AI art generators are in conflict over artistic customers, with defensive artistic technology and the U.S. government acting as tools to decide the victor. It follows that the OPP for this network would address this conflict. I define it as follows: Are there sufficient tools and protections in place to hinder AI art enough to protect artists? The remainder of this paper discusses these tools and analyzes their efficacy.



As described in the ANT analysis, most of the tools available to protect artists from generative AI can be separated into two categories: defensive artistic technologies and legal protections. Legal protections encompass court decisions, legislation, and actions taken by the U.S. Copyright Office in regard to generative AI and artists' rights. These actions, while they

may refer to a specific instance or company, can set precedent for how AI art will be treated and influence future legislation. Thus, legal protections can affect artists as a whole, offering blanket protection or lack thereof. On the other hand, defensive artistic technology is often designed to aid the user as an individual. Artists opt into a technology's protection by using the software. Both legal protections and personal technological protections are rapidly developing and changing, but in tandem, they provide a tentatively reasonable defense for artists.

### *Personal Technological Protections*

Many of the most prominent defensive artistic technologies for guarding artists against AI come from two parties: the AI company Spawning, and SAND Lab from the University of Chicago (Veltman, 2023, paras 3-13). Spawning advocates for increased transparency in AI training datasets and its tools aim to give artists the power to opt out of having their works included in training datasets. In contrast, SAND Lab's services focus on protecting individual artists from having their works mimicked in the future. In this section, I will discuss several of these groups' tools, which have different aims and methods with regards to empowering artists against AI art generators.

Spawning created an eponymous browser extension that allows users to check whether or not media on websites of interest, including artists' own websites, is present in public datasets commonly used to train AI. This service additionally connects artists to 'Have I Been Trained?', another service offered by Spawning. 'Have I Been Trained?' is a website that allows artists to search for their works or websites in the same public datasets that the browser extension queries, which gives the user more information on any media that had been flagged by Spawning. Both tools spread awareness to artists about potential copyright infringement. Finally, Spawning hosts the 'Do Not Train Registry', which artists can opt into to request that AI companies not scrape

their works for training data. Currently, Spawning has partnered with AI companies Stability AI and Hugging Face, which have agreed to abide by its registry. Kudurru, another service from Spawning, hosts a network of websites that artists can choose to opt into. Websites in the network watch for data scraping behavior and alert other sites upon detection, which collectively block the data scraper. Kudurru, then, focuses on allowing artists autonomy over whether their works are used to train generative AI (Spawning, n.d.).

SAND Lab's first offering was Glaze, which targets and opposes style mimicry using generative AI. Before an artist posts a work online, they can 'glaze' the piece using Glaze's desktop application or web service ('WebGlaze'), which alters the way generative AI parses it while being visually indistinguishable from the original piece (Glaze, 2023). Glaze is intended to disrupt the way generative AI "sees" artwork to ensure it is unable to replicate an artist's style if prompted. After Glaze, SAND Lab released Nightshade, which works in a similar 'cloaking' fashion, but is more offensive. Nightshade's cloaking, rather than defending against style mimicry, aims to disrupt generative AI's ability to recognize certain features, confusing them for other objects or art styles (Nightshade, 2024). Thus, when these 'shaded' pieces are scraped for training, the resulting model will be unable to return the expected image. Nightshade, unlike Glaze, is wider-reaching, and aims to protect artists as a whole rather than individuals.

### *Legal Protections*

In addition to defensive artistic technology, artists have turned to the legal system for protection. In early 2023, three artists: Sarah Andersen, Kelly McKernan, and Karla Ortiz filed a class action lawsuit against Midjourney, DeviantArt, and Stable Diffusion, arguing the companies train their AI systems on and profit off of artists' copyrighted images (Clark, 2023, para. 1). The artists' claims were mostly dismissed in a California federal court, including the

claims against Midjourney and DeviantArt. Two of the artists' copyright infringement claims were also dismissed on the grounds that they had not registered their artwork with the U.S. Copyright Office. The artists plan to amend their claims, with Andersen still pursuing her claim against Stable Diffusion (Brittain, 2023, paras. 2-3).

The U.S. Copyright Office itself has contended with AI art. Defenders of AI art argue that it is similar to a collage, and so falls under fair use and does not violate copyright (Day, 2023, Copyright and Technology section, para. 3). This argument bears resemblance to the reasoning for dismissing Andersen, McKernan, and Ortiz's case against Midjourney and DeviantArt. However, the ability for AI users to copyright their works is questionable. The U.S. Copyright Office defines copyright as protection extended to the authors of "original works of authorship," and specifically names humanity as a qualifier to being an author (2021, p. 1). The Copyright Office acted upon this when it twice denied Jason Allen copyright for the AI generated piece that won the Colorado State Fair's fine arts competition, explaining that he would have to exclude the portion of the image Midjourney generated from his claim to pursue copyright (Wilson, 2023, p. 1).

## **Discussion**

Artists are concerned about being replaced by AI art generators, and reasonably so. While Andersen's lawsuit is continuing, I find it concerning that the judge dismissed the artists' claims against Midjourney and DeviantArt. The result of this case is likely to set precedent for what images generative AI companies can use as training data. In the meantime, artists can utilize technologies like Kudurru, Spawning, and Spawning's 'Do Not Train Registry' to avoid having their artwork scraped. While some generative AI companies seem reluctant to consider artistic

copyright and may only be deterred by an aggressive tool like Kudurru, others, such as Stability AI and Hugging Face, have partnered with Spawning to honor their registry. This provides hope for a future where it is simple for artists to opt out of AI training datasets and trust that their copyright is not being violated. If Spawning gains more exposure, it is possible that other generative AI companies would follow its lead in an attempt to expand their user base to previously anti-AI artists. I, however, find this doubtful due to the lack of attention shown by Midjourney's CEO. Additionally, even though both companies have agreed to the 'Do Not Train Registry,' Hugging Face in particular hosts user models and code, which allowed malicious users to upload malware onto the platform in 2024 (Goodin, 2024, p.1-2). Given that users could host malware on the website, I find it reasonable to conclude that individual users could ignore Spawning's registry entirely while creating their models.

Glaze seems to be a successful tool to prevent style mimicry, and it has not yet been cracked (Glaze, 2023). Its inclusion in a web-based tool makes it accessible to a wide variety of artists, many of whom may be limited to mobile devices. Because Glaze is a personally protective tool, however, its full effectiveness is dependent on how much awareness it can gain in the artistic community. I would argue that it is successful in being well-known among artists on the internet. With AI art being a contentious, hotly debated topic, Glaze has quickly garnered attention as a protective tool and has been widely shared on social media, where I first discovered it. With the success of Glaze, SAND Lab's next project, Nightshade, had a guaranteed audience. Nightshade, additionally, can protect a wider array of artists by confusing the AI model, causing it to mis-associate words and images. SAND Lab plans to add the functionality of Nightshade to the WebGlaze tool, improving the tool's efficacy and accessibility.

Altogether, these tools seem tentatively comprehensive regarding protecting artistic copyright and preventing generative AI companies from scraping artworks without harm. Kudurru, Glaze, and Nightshade especially were created to defend against AI art models being trained with non-consenting artist's works, although the efficacy of the 'Do Not Train Registry' is not guaranteed. Additionally, there are fewer tools that can divert artistic customers away from AI image generators already in use, provided the customer is not seeking the style of an artist who 'glazed' or 'shaded' their work. One deterrent to employing AI may be the failures of AI art generators to properly depict minority groups, but I am not convinced that an artistic customer who is unconcerned with how AI affects artists would be concerned with diversity that reflects the real world so long as the generated image's quality is passable. A more effective deterrent is the precedent set by the U.S. Copyright Office regarding Jason Allen's inability to copyright his Midjourney-generated piece. If an artistic customer seeks to copyright their work, they may be deterred from using generative AI. Aside from being a practical barrier to generative AI, this decision by the Copyright Office also prevents the legitimization of AI art. Artists' concerns are correct and reasonable, but given their allies' rapid mobilization, it is possible that artists will be able to fight back against AI art for the time being.

## **Conclusion**

Artificial intelligence is rapidly growing and shows no signs of slowing down. While it may aid some fields, such as cybersecurity, its questionable copyright, stereotypical depictions of minority groups, and the competition it creates for artists demonstrate that AI art in its current form is largely harmful. Through an ANT analysis and study of the different tools artists have available to protect themselves and their works, I found that, while these tools are better at



defending artists in certain ways over others (such as protecting artistic copyright more effectively than ensuring freedom from AI competition) these tools provide a promising start to assuaging artists' worries. Additionally, some large and influential generative AI companies, such as Stability AI, are taking small steps toward behaving more ethically regarding the artists they profit off of. It remains to be seen whether other companies will follow suit. Moving forward, artists can continue to spread awareness of protective tools as they await future legislation that could continue to alter both the landscape of artificial intelligence and the future of art.

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