Addressing the Ethical and Legal Implications of Machine Learning in Visual Art Creation

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Introduction

In 2022, the winner of the Colorado State Fair's annual art competition became the catalyst for a groundbreaking set of developments that permanently changed the world of the visual arts industry. Jason M. Allen and his winning artwork Théâtre D'opéra Spatial (Figure 1) sparked divisive ethical and legal controversies from artists surrounding the method Allen used to create it. Théâtre D'opéra Spatial was made through Midjourney, an Artificial Intelligence technology capable of creating digital images based on entered text parameters (Jaruga-Rozdolska, 2022). This generative tool breaks down words into small pieces that can be compared to its training data (built off previously authored artwork) to generate an image in a process called Machine Learning (ML). Allen's claim to a prestigious art prize that resulted from his use of a generative ML technology left artists stirred regarding the ethicality and legality of using such technologies to create visual art.

Figure 1. Théâtre D'opéra Spatial — Jason M. Allen (Sources: Medium, 2022)

Allen's unexpected use of Midjourney for visual art creation probed artists to question the ethicality and legality of his actions. For instance, Allen's actions left artists increasingly doubtful about the future of their profession due to their belief that there will be a decreasing need for commissioned art given the generative capabilities of ML. When Allen used Midjourney to directly generate visual artwork, artists believed ML to be unethical and became extremely opposed to the act since creating art with ML undermined the years of practice undertaken by artists to create a living. The reliance on previously authored art by Midjourney and other ML technologies to create their training data also exacerbated fierce discontentment since these technologies plagiarize other artists when generating artwork. Midjourney's generative method ultimately drew attention to the overarching issue of whether the use of ML technologies constitutes as "cheating" in the creation of visual art.

In consideration of these controversies, it is evident that the ethical and legal implications uncovered from Allen's use of Machine Learning technologies must be properly addressed to establish a productive relationship between the technology and the visual art industry. Within this paper, I will explore the relationship between artist and ML to discover how artists can properly address these ethical and legal implications that have risen from ML's use in visual art creation. I will do so by researching the opinions of professionals who understand the artistic, technological, and legal aspects involved when visual artists use ML technologies. Through this research, I will make grounded observations on how artists must use ML technologies to address its ethical and legal concerns and make the technology more productive for the visual art industry in the future.

Case Context

Machine Learning technologies expand upon human intelligence, creating machines capable of outperforming human beings with average intellect in complex tasks (Anjila, 1984; El Naqa & Murphy, 2015). The capabilities of ML have motivated many industries to replace human labor with integrated ML technologies to complete day-to-day operations.

One industry that has heavily integrated Machine Learning technologies is the visual art industry. Visual arts are characterized by the production, development, and exhibition of works that are primarily visual in nature, with some of its most prominent examples being painting, drawing, and photography. In its creation, a visual art relies entirely only on two central components: a creative input from an artist serving as the motivator/meaning for an artwork, and the act of physically developing the idea into a visual artwork. While the development of a creative idea may provide a challenge for artists, the physically translation of the idea into an artwork can be much harder in comparison.

ML technologies have provided a promising solution to these challenges due to their effective generative prowess, simplistic usability, and inarguable efficiency. ML technologies such as Midjourney allow artists to generate any artwork based on their specific needs. These technologies work through text-based prompts that are supplied by the human user, demonstrating their simplistic usability. Once a text prompt is inputted, the generative prowess of the technology can produce a visually stunning graphic that rivals the work of human artists and addresses the user's inputted needs, as demonstrated in Allen's Théâtre D'opéra Spatial (Figure 1). This process makes the creation of visual art much more efficient when compared to an artwork's the traditional developmental process, leading to the increased integration of ML technologies in visual art today.

As exemplified in the aftermath of Allen's work, however, the application of ML technologies in visual arts has raised significant ethical and legal implications that directly affect artists and their relationship with the technology. Legally, issues arise in authorship concerns since the training data of ML technologies are built off previously authored artwork. The structure of ML training data causes the technology to have a natural inability to produce original artwork since they learn and generate solely on a culmination of human-created artwork. As a result, artwork generated using ML technologies have led to fierce criticism from artists since they can plagiarize the work of human artists. Ethically, the prowess of ML technologies threatens the livelihood of artists who may not use such technologies in their production. The simplistic usability and efficiency of visual artwork generation through text-based prompts allows artists to quickly create art in much higher quantities and in much less time than traditional artists. If used irresponsibly, ML can indirectly undermine the dedication and skills visual artists must cultivate to make a livelihood in their industry.

The ethical and legal implications stemming from the use of ML technologies have created strong behaviors of opposition and stigma towards the technology from visual artists who feel threatened by its incredible productive capabilities. This stigma has prohibited the technology from becoming more productive in the visual art industry despite its beneficial capabilities. In the future, it's increasingly important that the relationship between artist and ML be properly revised to address these concerns as ML technologies continue to expand in use.

STS Framework

Machine Learning's increased integration within the visual art industry has led to an intersection of art and technology that fosters a growing number of creative technical

applications within the processes of visual art production (Cetinic & She, 2022). However, the integration of ML has also led to significant ethical and legal implications that have negatively shaped its use and perception in the industry. These implications will be unpacked using the framework of Actor Network Theory from Bruno Latour's work in *Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts*.

Actor Network Theory (ANT) can be understood as an analysis of the relationships established between the human and non-human components (or actors) in a sociotechnical network and how they contribute to the development of a technology's ethical and social considerations overtime. Latour emphasizes that there is no dichotomy between the human and inhuman; they are both symmetrical actors within a network. He asserts this facet of symmetry by emphasizing that as a society inscribes usages into non-human actors, non-human actors symmetrically prescribe actions and behaviors onto society (Latour, 1992). This is seen in his network between society and the door when society began using the door to enter enclosed spaces and when the door symmetrically prescribed the behavior to close doors after they've been opened. Latour also uses the door to demonstrate the evolving nature of sociotechnical relationships, another facet in ANT. When ethical issues emerge from society's interactions with the technology, society will reinscribe different uses into the technology which cause the sociotechnical network to adapt and change the technology's influence on society. This is seen in the creation of automated doors for humans with disabilities, which emerged in response to ethical concerns with the door. Synonymous to the society door network, Actor Network Theory can be applied to artists and Machine Learning technologies in the visual arts industry to understand how both actors symmetrically shape each other and how their relationship evolves in response to the ethical and legal implications that emerge from the technology's use. These

facets are demonstrated through a visualization of the sociotechnical network between artists and ML, see Figure 2.
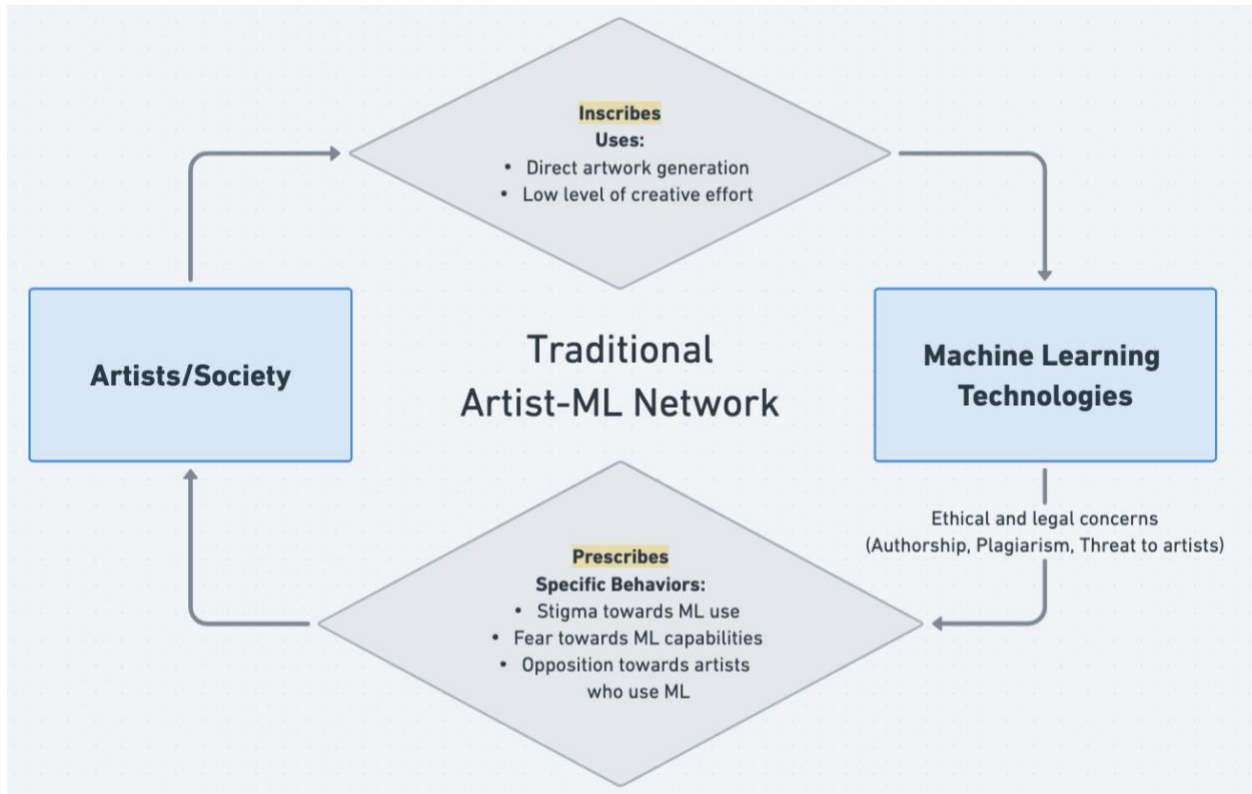

Figure 2. Artist-ML Network with Traditional Generative Methods through ANT (Kim, 2024)

When artists inscribe uses that trigger legal concerns into ML for artistic creation, ML technologies symmetrically prescribe significant behaviors and actions into artists that influence their work significantly (Figure 2). Legal issues arise with ML artwork generation since the ML model's training data is built off previously authored art (McCormack et al., 2023). When artists rely on ML to create visual artwork and claim the works as their own, the training data used to generate such art from ML technologies enable artists to plagiarize the work of other artists, impersonate their styles, or infringe on artwork copyright (Jiang et al., 2023). In terms of ANT, artists who inscribe such uses which heighten legal concerns into ML technologies allow it to

symmetrically prescribe behaviors/actions into artists that reflect artist stigma, hatred, and opposition towards ML use in visual art creation (Figure 2). This equal agency of influence that exists between artists and ML technologies exemplifies the key facet of symmetry from ANT that is synonymous in Latour's analysis of the door.

Inscribing ML technologies with such methods have also led to ethical concerns which exacerbate the prescription of oppositional behaviors against the technology into the visual artist community. For instance, the continuous use of powerful ML technologies has sparked outrage from prominent artists who deem the technology as threatening (Mitkus et al., 2023). When artists inscribe uses into ML technologies for visual art generation (and claim the works as their own), ethical concerns emerge in relation to plagiarism of other artists' work and threats to the artist professions. These concerns contribute to behaviors from artists condemning ML use in visual art creation, reflecting the symmetrically influential roles both human and non-human actors have within their network.

A key facet of ANT that is critical to addressing artist concerns and stigma surrounding ML is the evolving nature of relationships within a sociotechnical network. In Latour's analysis, this evolving relationship is demonstrated between society and the door through the creation of automated doors for disabled humans. Society reinscribes different uses on the door in response to the ethical issues that emerge from its use. Like this relationship, artists can evolve their relationship with ML by reinscribing different uses into it. However, the lack of such action has exacerbated the development of negative behaviors towards ML and attributed to its unproductive nature in the visual art industry (Figure 2).

Given the key facets of symmetry and evolving nature of relationships from ANT, ANT can be used to uncover how the legal and ethical implications imposed by ML technologies in

visual art can be addressed by artists to create a more productive relationship between artists and ML technologies.

Research Question & Methods

Artists can use the productive capabilities of ML technologies to create visual artwork. However, they must address the ethical and legal implications that are imposed when using these technologies as well. This leads to an important question: How can the ethical and legal implications of Machine Learning technologies be addressed by artists to make the technologies more productive in the creation of visual arts?

To investigate this question, I conducted four interviews which explored the artistic, technological, or legal sides of the issue. One interview focused on an artist with direct experience using ML technologies for visual art creation, while the other three focused on professors at the University of Virginia (UVA) representing the issue's three different dimensions. I found and contacted the artist for my study through the "r/Art" community on Reddit, a social platform where users can form like-minded communities called subreddits (Proferes et. al., 2021). I found and contacted the professors for my study by searching within the UVA Department of Art, School of Law, and School of Engineering & Applied Sciences. After contact, I virtually interviewed the interested participants through Zoom, a direct communication technology, and asked them four questions:

1. What are your thoughts on AI raising concerns about authorship and taking the professions of human artists?

2. What ethical and legal issues have you experienced because of ML technologies?

3. How do you think ML can be integrated differently to be more productive in the creation of visual art?

4. Currently, studies have shown that society prefers human-created art over ML-generated art. If the use of ML were to be changed in response to its ethical and legal concerns, do you think society would view its artworks differently?

For the artist, I included an additional question to examine their personal experience with ML:

5. How has ML influenced the creation of your artwork?

I analyzed the data collected from each interview using an ANT framework to discover how the emerging ethical and legal issues from ML technologies can be approached given the principles demonstrated in Latour's network analysis of the door (Latour, 1992). Specifically, I made observations on how visual artists can address the ethical and legal implications of ML technologies to create visual art more productively given their role in the artist-ML network (Figure 2).

Results

The key finding is that artists must use ML technologies as an assistant to their own personal creativity to challenge themselves creatively and grow their artistic capabilities in order to address ML's ethical and legal concerns and make it more productive. This was derived from two specific findings within my research. The first finding was that due to the permanence of ML technologies in the world, artists must learn to use the technologies beneficially instead of shying away from it. The powerful capabilities of ML technologies make it a tool with long-term industrial value (Surya, 2016). Therefore, artists must embrace change by exploring how they

can use ML productively within their work. The second finding was that prompt-based generative machine learning systems are inherently limited by their inability to produce original work and rely on creative human input (Hageback & Hedblom, 2022). If artists understand the inherent limitations of ML, they can use the technology more responsibly and ethically to reshape the controversy surrounding it. Examining the interviews by art, technology, and law reveals how these findings influence the network between artists and ML and contribute to the key finding of my research.

Interviews with Loes Reijnders (a visual artist with direct experience with ML technologies) and Professor Mona Kasra (a professor of Studio Art at UVA) were conducted to explore the artistic side of the artist-ML network. Loes uses ML within her visual artwork as a source of inspiration after she has developed a visual concept for her artwork: "I kind of use it as a tool to get inspiration when it comes to reference photos." (L. Reijnders, personal communication, February 7, 2024)

One example of this is when she uses ML to "visualize someone in a specific pose for her" which in turn enhances her artwork. Loes' application of ML stands apart from the common practice of using AI/ML to generate visual artwork (McCormack et al., 2019), and is important since it addresses the ethical and legal concerns surrounding the technology's use. By using the generated products of ML technologies for inspiration rather than claiming them as her own, Loes shows how artists can evolve their relationship with ML so that it can be used without infringing on the authorship of other artists and threatening their work. Her use of ML technologies demonstrates that ML can be used productively to create visual art if it serves as an assistant and developmental tool to an artist's creativity (Xu & Nazir, 2022). These ideas are supported further from the insights drawn in Professor Kasra's interview.

Kasra views ML as a tool where artists can "challenge the tools and enhance their work". She emphasizes this through own experience to demonstrate that AI's generative capabilities still require effort and creativity from human artists: "I used a lot of AI for the creation of the images. It's a lot of work… you have to just do this dance and get to where you want to go." (M. Kasra, personal communication, February 9, 2024)

Kasra's idea that ML technologies can be challenged to enhance an artist's work is synonymous to that of Loes' and shows that ML is synonymous to other artistic tools since it can be used to help artists creatively grow. Like cameras or digital editing software, ML allows artists to reach new creative heights if they challenge and explore the technology to create visual art in ethical and legal ways. Kasra affirms this by noting that the technology is "a lot of work" and that artists "have to just do this dance and get to where you want to go", challenging the myth that ML can create art without artists (Audry, 2021) and showing that ML use requires the creativity of the artist. ML's inherent limitations as a tool can be used by artists to minimize the technology's ethical and legal concerns in society.

To explore the technical side of artist-ML network, an interview with Professor Tom Fletcher (a professor of Computer Science at UVA with ML research) was conducted. Professor Fletcher first recognizes the danger of ML technologies if used unethically, noting the legal concerns that could stem from using previously authored work without permission, replicating existing artwork, or imitating artistic styles based on machine training data. However, he also recognizes its productive value if used ethically and legally due to the creativity involved:

> It's still a very creative process, like the human is still putting a lot of their creativity and
> eye for visual art, what works and what doesn't, what they want to achieve, into the AI…

User's job to use it in an ethical way. (T. Fletcher, personal communication, February 8,

2024)

Fletcher's label of ML as a creative process expands on Kasra's idea of artists having to "do this

dance and get to where you want to go". Both ideas emphasize the artist's role in the artist-ML

network since artists can choose how they use ML, what it creates, and how it influences society.

Fletcher also comments that it's the "User's job to use it (ML) in an ethical way", which

demonstrates that if the artist fails to use ML technologies responsibly, they will ultimately fail

their "job" and exacerbate the ethical and legal concerns currently imposed by the technology.

When artists use ML and its creations for their personal creative needs, their uses dictate how the

technology is viewed within society: as a tool or as a threat. Therefore, Fletcher emphasizes the

responsibility, or "job", artists hold to use ML in ethical and legal ways and to use it differently

if new concerns arise.

A final interview with Professor Dotan Oliar (a professor of law at UVA with a focus on

human creativity) was conducted to explore the legal side of the artist-ML network. The

interview focused primarily on copyright law and the Doctrine of Fair Use, where Oliar used

such laws to demonstrate the factors courts consider when discussing the legality of a

technological case trial:

Section 107 of the Copyright Act says that courts think about some things in deciding

whether something is fair or not… how much harm is done to the author… how

creative it (the work) is… how much was taken. (D. Oliar, personal communication,

February 13, 2024)

Oliar's legal review of ML in visual art creation suggests that artists have key responsibilities in

minimizing its ethical and legal concerns. The severity of ML copyright infringement is

dependent on how the author uses ML to create their artwork (Latman, 1980) and can be connected to the ideas of Professors Kasra and Fletcher. Since copyright infringement is based on how the author uses the technology (and given that ML usage/creation requires the effort and creativity of artists), addressing the technology's concerns is dependent on the artist and therefore becomes the artist's responsibility. Artists who do not put in the effort to use ML to challenge their personal creativity will exacerbate the legal concern of authorship and ethical concern of stealing artists' livelihoods. Artists who do put in this effort, however, can artistically grow using ML's capabilities whilst minimizing its potential legal and ethical impact.

All four interviews recognized the powerful capabilities of ML and how they contribute to the technology's continued integration within the industry despite its ethical and legal concerns. However, they also emphasized the inherent limitations of ML since it requires effort and creativity from human artists in its use. Addressing the concerns of ML in visual art creation is dependent on how artists choose to use it for their art. Therefore, the four interviews can be connected into the key finding that artists must use ML as an assistant to their own personal creativity and to challenge/grow their artistic capabilities in order to address the ethical and legal concerns surrounding its use.

Discussion

My research suggests that artists must use ML as an assistive tool to creatively challenge themselves and grow their artistic capabilities in order to address the concerns and productivity of ML in visual art creation. This conclusion is supported following the key principles of Latour's ANT visualized in the revised artist-ML network in Figure 3, which incorporates my research findings. Artists can take advantage of the facets of symmetry and evolving

relationships from ANT since reinscribing uses into ML that require a high level of effort from artists and challenge their creativity (i.e. for inspiration) will cause ML to symmetrically prescribe behaviors that minimize the stigma of the technology and encourage artists to creatively explore the capabilities of ML (Figure 3). The artist-ML network will adapt to the assistive uses inscribed into ML and minimize the ethical and legal concerns imposed by the technology, resulting in an artist-ML relationship that has evolved to become more productive. These findings can be applied when reexamining the legality of Jason M. Allen's Théâtre D'opéra Spatial (Figure 1) to understand how Allen could've used the technology more productively. The U.S. Copyright Office refused to register the copyright claim in the work given that it contained an excessive amount of ML-generated content and since Allen was unwilling to disclaim the ML-generated material (U.S. Copyright Office, 2023). Allen's inscribed use of direct artwork generation into ML not only prevented his work from being legally protected but more importantly contributed to negative behaviors against ML use within other artists, see Figure 2. If Allen had inscribed more assistive, creative, and effortful uses into ML, it is evident that the technology would have prescribed supportive behaviors into artists that were accepting of Allen's work and his use of ML instead of shunning it, see Figure 3.
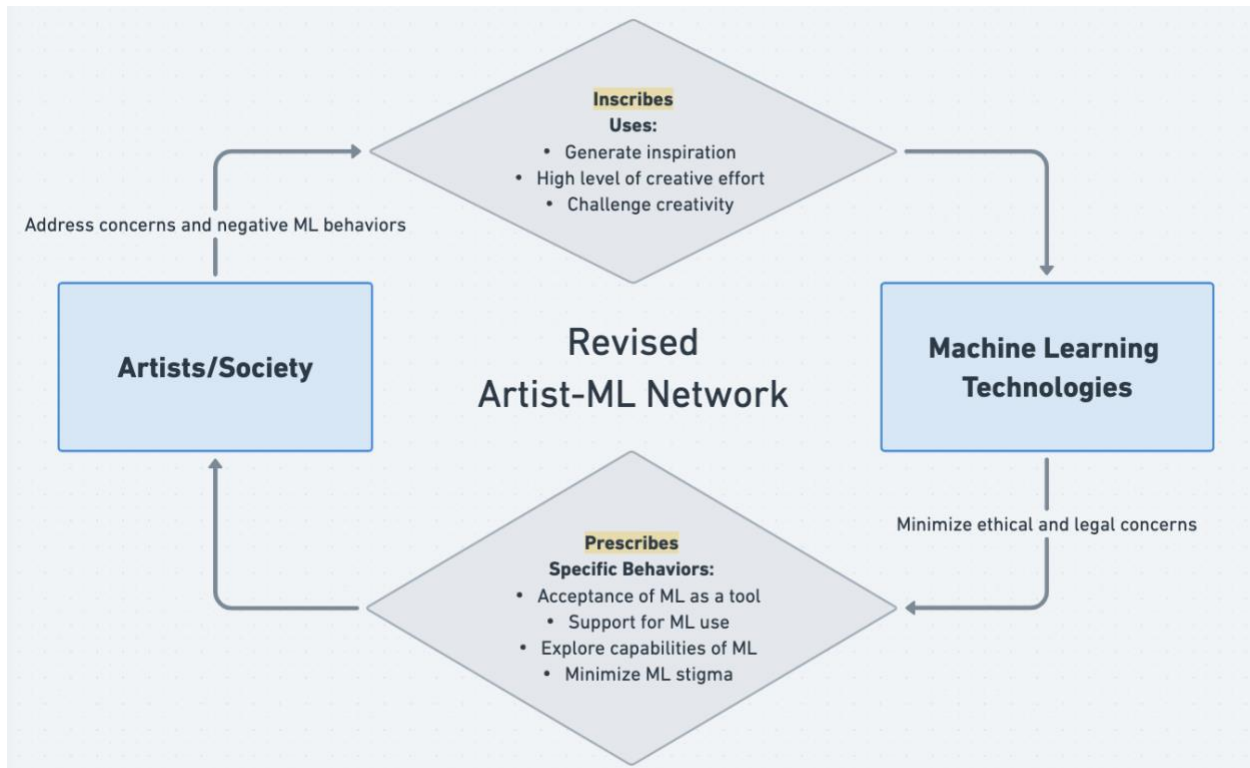
Figure 3. Artist-ML Network using ML as assistive tool to challenge/grow creativity through ANT (Kim, 2024)

The most significant limitations of this research revolve around the number of interviews conducted and the novelty of ML technologies in industry today. An increased number of interviews would have allowed me to draw stronger observations to increase the credibility of my conclusions. Additionally, the extent of my research is limited due to the novelty of ML technologies today. The lack of exploration conducted with ML makes it hard to define the ceiling of its capabilities and the specific legal regulations that should be in-place to address it (Jordan & Mitchell, 2015). While future developments may address these matters, it remains difficult to emphasize the long-term value of my results.

If I were repeat this study in the future, I would aim to increase the number and diversity of the interviewees. For artists I would focus on interviewing more participants of different ages, backgrounds, and visual art specializations. For professors I would focus on interviewing more

participants from different institutions. By increasing interviewee diversity and size, I would be able to analyze a broader set of perspectives that could affect the results of my study. In terms of frameworks, I would also consider examining my research through a Care Ethics framework to understand how the values of care and relationships can be emphasized within ML technologies to protect human artists.

My research on this subject has broadened my view of how useful ML technologies can be to the world. I was specifically surprised to see the creative ways artists have applied ML to better their artwork. I also appreciated conducting interviews with UVA since it gave me the opportunity to learn from experts in non-engineering fields. Being an engineer, I wouldn't normally speak with professors with expertise in copyright law or visual/studio art, and it served as an enlightening experience to learn about the social ramifications of technologies.

Conclusion

Machine Learning has seen increased integration within the Visual Art industry due to its generative prowess, simplistic usability, and inarguable efficiency. However, it has also been met with concern based on the ethicality and legality of its use (Skoff, 2017). To address these concerns and make ML more productive in visual art creation, artists must use ML as an assistive tool alongside their personal creativity to challenge themselves and grow their artistic capabilities (Ye, 2021). Although this research concentrated on the relationship between artist and ML, making ML productive in the visual art industry is dependent on the interconnection of various social groups and actors who all equally shape the development and application of the technology. Engineers and regulators hold equal agency to artists and ML in shaping the technology's influence on society. Therefore, they must ensure that ML incorporates high levels

of human effort to push the creativity of artists. Minimizing the concerns of ML use requires

attention, responsibility, and action from artists, engineers, and regulators alike. Future research

must be concentrated in this unified effort to maximize the productivity of ML in visual art

creation.

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