AI Image Generation: Advances and Ethical Concerns

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ABSTRACT

As AI image generation advances, its capabilities bring ethical concerns over plagiarism and potential for misuse. This is a concern because it can negatively affect artists and the image generation can be misused for misinformation. AI is currently used to detect plagiarism and fake images, and those technologies could be adapted to detect AI image-generation. Even if an AI image can be detected there are still problems as the definition of plagiarism with AI is not clear. Also, even if images can be identified as fake, the images may be viewed where they are not analyzed. The ethical issues with AI are problems which are difficult if not impossible to solve in a way that satisfies all stakeholders. This is a multi-faceted problem and represents the varying viewpoints in ethical issues with AI image-generation. Updated intellectual property laws may be needed to address and create legal precedence to the issues arising from the use of AI technology.

1. INTRODUCTION

How can humans compete against computers? To put it simply, they cannot, at least not directly. Computers have long since surpassed humans in certain tasks, humans can only find areas in which the flexibility of their brains allows them to prosper where a computer is not viable. However, with the increasing capabilities of AI, lines are being crossed in some areas previously thought to be only accessible to humans. This presents ethical concerns about the work and increased competition from and misuse of AI, especially in areas of the arts and image editing.

Advances in AI image generation have made it possible for higher quality images to be generated for anything that can be described. Even more importantly, the accessibility of this technology has also expanded greatly. While there are many players in this field, stable diffusion is the most prominent publicly. Stable diffusion's accessibility in its interface and usage requirements creates mainstream concerns related to AI image-generation usage. These concerns include plagiarism and misinformation generation. Worse, ethical concerns posed by AI image generation is a problem with no perfect solution. As the concerns are socially related, solutions that benefit one side, potentially alienates the other side.

2. RELATED WORKS

As mainstream AI image generation is relatively new, there is a lack of scholarly works on the topic. However, there are articles and opinions that are relevant to the AI's ethical ramifications.

Heikkila (2022) discusses a problem that the artist, Rutkowski, has been having with AI. His works have a distinctive style and his name has been used as prompt over 93,000 times at publication of the article.

The fact that the artist did not consent to his work being used raises copyright concerns for the technology.

Sung (2022) states artists' concern over a portrait generation utilizing Lensa, including the contention that AI floods the sector with cheap copies and forgeries. They also cite the CEO of Prism labs who claims that they are just trying to make AI technology more accessible and contends that AI will not replace the artist. Sung further points out that the scraping of public images for use in these models may fall under fair use laws, but sparse legal precedent exists to support this contention.

3. PROCESS ANALYSIS

An ethical concern is plagiarism with AI. Models that are used in image generation have been trained on many images, many without consent. Is it plagiarism to use an image for training without permission? AI models do have some curation, training models are usually created autonomously, scraping images and tags from art content distribution centers.

The most prominent public AI image generation software, stable diffusion, uses a form of neural networks. Neural networks are a form of machine learning that emulates how the human brain learns (Andrew, 2023). From the logic that the learning is based on humans, it can be argued that the AI being trained is similar to a human finding inspiration from other works and producing art based on their experiences. While there is some logic to this argument, the human mind is much more complex than a neural network and training on unauthorized images is a conscious decision unlike a human subconsciously learning from experiences.

Many artists' works can be considered derivative, so should AI image-generation be considered in the same way? This is difficult to answer because, due to the size and complexity of the models and processes, it is impossible to determine the source of many images generated by AI. However, sometimes models do not have a diverse set of data regarding certain tags, which results in generation that obviously derived from specific sources (Andrew, 2023). There are not definite laws for questions involving AI to date; however, many have their personal interpretations of existing law and their own opinions (Illustrator, 2016). Many artists consider the scraping of art without permission an offense by itself, whether or not a product of generation. Some users of AI image-generation see it only as plagiarism when it is obvious that the AI has closely derived its generation from a specific source. Conversely, many users do not concern themselves with ethics or plagiarism, since they are merely using a tool for their own purposes (Heikkilä, 2022).

Some artists feel threatened by the existence of AI image-generation. In certain art competitions AI images have placed highly. Artists that really on commissions to make a living are also fearful of AI digging into their niche. Content distribution centers of art have been spammed with AI images which can drown out artists. However, some artists have differing options, such as not seeing AI art as a threat to artists because of its current limitations, or seeing AI image-generation as a tool that current artists can use (Mok, 2023).

Increased accessibility to spread misinformation with AI-generated images is another ethical concern. Misinformative images have always been present, but making convincing images takes a certain measure of competency and effort. Creating a fake image requires skills in image editing software. It also requires specific knowledge on how to make alterations look as natural as possible. Most of all, it can save time and effort even for those with those skills to make a convincing image. AI image-

generation mitigates those requirements. AI replaces the skill to make those edits with the ability to use the interface. Time spent meticulously modifying an image is replaced with the time typing a prompt and generating an image. Currently the AI technology requires some tuning as higher quality of those generated images may require a good model, prompting, and sometimes effort. However, all of those possible limiting factors are diminished as the AI improves.

4. SOLUTIONS

In the field of science technology in society (STS), there is a framework known as wicked problem framing. A wicked problem is a challenging to impossible problem to solve for a variety of factors. A reason that a problem may be a wicked one is cultural conflicts with the problem, with one solution being perfect for one group, but unsatisfying for another. The issues presented by the ethical ramifications by AI image generation are wicked problems, with the solutions either only going so far or not satisfying all the stakeholders of the issues.

There are some solutions artists have been attempting to use to combat the ethical issue of AI image-generation. One such way is the obfuscation of their art to AI training. This can be done by adding subtle digital noise to art that is usually not noticeable by the human eye, but it can mitigate the effectiveness of AI training on the image (Brodsky, 2023). Techniques that prevent a piece of art from being trained on can either add noise to make the image look nonsensical to the AI or deliberately add noise that confuses the AI's recognition of tags. This is known as a style transfer, and if an AI is trained with a sufficient number of marked images, it can be detrimental to the AI's accuracy (Lawson-Tancred, 2023). The problem with these solutions is it only can affect new art that artists specifically apply

the noise on, it cannot be used on images that were already scraped and many artists may not use the technology. So it could protect an individual artist's style for future works, but not for existing works. From the perspective of the proponents of AI image generation this solution can effectively be sabotage for the learning of their models.

A more extreme measure is various forms of banning. While it is unlikely that AI image-generation as whole will be banned, banning will not stop an already released open-source software with many downloads. More realistically regulations on what data can be used to generate models for training can be created. However, anonymous individuals with access to an open-source software will do whatever they want. Therefore, in the event on regulations that protect artists' art from being scraped without consent, it will only stop certain entities that care about those regulations.

Besides banning the software and unethical data collection, separating AI images in art competitions and content distribution centers is a solution. While some AI images may slip through the cracks, this solution allows artists not to have to worry about competing or being drowned out by AI images. However, those who create AI images may feel that this is unfair and they should be allowed to compete and post alongside traditional artists as separated places may not be as popular. Another issue that is possibly niche, but still has happened is an artist's art being mistaken for AI. This happened on Reddit with a user being banned on the subreddit r/art for posting AI when it was not an AI image (Liscia, 2023).

A solution to fake images is using AI for detection. While the technology does solve the problem of detection, it only works if it is used. Not everyone verifies everything they see. Media platforms could implement recognition technology in their methods and systems to warn users of fake imagery. This

solves some problems, but it could require large overhead to develop and maintain. The issue of fake imagery being spread privately and on smaller platforms where detection is not feasible is still a problem.

The presence of easily producible fake image causes another concern: uncertainty of what is real. An example of this is seeing a news article featuring images of a politician committing a crime. Supporters of that politician may have their doubts because of the prevalence of fake images being generated easily by anybody. More maliciously, someone could commit a crime and then claim innocence with the argument that the evidence was faked and possibly create fake evidence to poison the well. With the nature of misinformation, a good solution is very hard to impossible to find. Education on misinformation is one method, but there will be always those who are not educated, sometimes without a choice, and sometimes their education itself is misinformation.

5. CONCLUSION

AI image-generation has three main ethical concerns. The effect on artists, plagiarism and misinformation. There are solutions to each of those problems, but the solutions are not foolproof and are not satisfactory to all stakeholders. There is no perfect solution, but the most likely solution for each ethical concern is as follows:

1) for artists, AI images should be separated from traditional artists in competitions and content distribution'
2) for plagiarism, specific laws that prohibit scraping unauthorized images should be passed.
3) for misinformation, education is a method to mitigate it.

6. FUTURE WORK

Originally, I would have liked to connect with real artists and developers/advocates of AI image-generation. I would have interviewed them on this topic and used their opinions to demonstrate varying viewpoints from stakeholders in the topic. For the future it also may be interesting to go into detail how the technology may evolve and how improvements may affect or create new ethical concerns.

7. UVA EVALUATION

I learned a lot from the computer science program, especially Software Development. The class taught the development process for software as well as how teams worked together and emulated the environment of one through the class's main project.

8. ACKNOWLEDGMENTS

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