I am an artist, as well as a software developer with a Master's degree in computer science who has studied AI applications. This background gives me a substantial stake in the results of any regulations concerning generative AI, as I desire assurance that my rights associated with my artistic works will not be infringed upon with no recourse due to the proliferation of this technology, and I desire clarity for what the law would require of me as a developer when working on tools which utilize artificial intelligence, and what protections it may grant. These are my thoughts on recent developments in generative AI technology, informed by my own understanding and research as a student and hobbyist, and how I believe these developments should interact with copyright.

Recent developments in generative AI have enabled users to utilize natural language in order to generate relevant text, images, code, and more. These innovations have captured the attention of everyone from casual users, to professionals, and to studio executives. The promise of these generative AI models is to substantially reduce the labor required to produce works, thus increasing productivity, and correspondingly, increasing throughput and reducing costs.

Much of the discussion around these AI tools is in relation to their "learning" process. This new generation of AI consumes large amounts of existing (i.e., human-generated) information in a process where the model is "trained" to produce results that resemble the consumed information, but are ideally novel and relevant to the user's prompt [1]. This training process is intensive in terms of computing power, but can require human power as well. Large-scale commercial model maintainers such as OpenAI are known to hire workers to assist with their models' training processes [2]. A commonly-known behavior resulting from this approach is that models trained this way are prone to "overfitting," in which the output of the model matches the consumed information too closely, thus restricting the ability of the tool to generate novel results [3]. Overfitting is undesirable for those maintaining a generative AI model and users of that model, and can often be solved through careful tuning of the training data and other model parameters.

With these observations in mind, I will relate my thoughts on the relationship between AI and the creative world.

Firstly, many observers severely misunderstand the capability and function of AI models. We anthropomorphize generative AI models by saying they "learn" and "train," however the function of these models is fundamentally dissimilar from *human* processes of learning. It is true that both humans and generative AI, in a sense, consume information from external sources in order to create novel work, however, a generative AI achieves this process through complex mathematical models which produce probabilistic predictions based upon a user's input. Many will insist that the AI "learns" to create work via a comparable process to a human honing their skills and identity as an artist; this view overstates and overly abstracts the actual functionality of generative AI. A generative AI model, for instance, does not learn common story structures, musical theory, artistic composition, human anatomy, or color theory in order to inform its decisions in creating stories, music, or art–it is simply a prediction engine which attempts to create an output that probabilistically follows an input based on the model's internal state produced by the training data.

Second, generative AI is fundamentally reliant on its training data in a manner which far exceeds the reliance a human creator has on inspiring works. External, existing information is inextricable from the function of generative AI. A generative AI that has never ingested the

works of Picasso will never produce works in the style of Picasso, and a model that only trained using Shakespeare's tragedies in English will never produce poems in Old Chinese. It is reasonable, then, to say that an AI model produced using copyrighted works could not possibly produce its output without having ingested those works. If a user is able to prompt a generative AI to create works in the style of an artist they found on ArtStation, the model could only possibly adequately fulfill the user's request if its model included that artist's works in its training data.

In this sense, generative AI is capable of effectively laundering copyright; a model can be trained on swathes of high-quality, varied, copyrighted works, becoming highly versatile in responding to users' prompts (thus maximizing the AI's utility and commercial value), and hiding its reliance on those copyrighted works by producing output which is *technically* novel, but which could not exist had those copyrighted works not been introduced into the training data. In many cases, it is impossible to be certain that all works in a model's training data were included with permission from the authors. Additionally, removing copyrighted works from a model is often a highly impractical and expensive endeavor, though AI developers are making progress on this issue [4].

This fosters an adversarial relationship between copyright holders and third-party model providers: if the training data is not publicly known, then copyright holders cannot be certain that their works are disincluded. At the same time, if the entirety of a model's training data were to be public, then third parties could feasibly (though not necessarily easily) replicate that model by using the same data, which may harm providers who sell access to an AI model. This relationship may also create anxiety for those who wish to use third-party generative AI tools, since potential liabilities associated with using generative AI trained on copyrighted data are unclear. It is additionally unclear to users whether they will be awarded copyrights for works utilizing generative AI tools now or in the future, which further disincentivizes the adoption of generative AI into professional workflows.

I believe generative AI is a powerful technology that will inevitably see adoption in a wide variety of use cases. Providing clear guidance and expectations to studios, artists, writers, developers, executives, and all others with a vested interest in this topic is thus paramount to ensuring healthy development of affected industries. Based on this discussion, I would like to provide some recommendations for how future copyright policy could adapt as we move into this uncharted territory.

I recommend that measures be taken to ensure copyright holders can independently and easily understand if a commercial AI model was trained using their works. The exact form of these measures should be left to developers as a one-size-fits-all solution is doubtful to exist now and ever into the future, but it should nevertheless be straightforward for a copyright holder to discover if their works are being utilized to train publicly-accessible AI models without their permission. Naturally, these measures include recourse for copyright holders whose rights have been infringed upon to construct an AI model.

Developers of AI models should always be capable of producing some meaningful reports on what materials are within their training data, including copyright metadata for all included information. It should be unacceptable for an AI model owner to be incapable of answering questions in a civil or criminal proceeding about whether or not a particular copyright holder's works are present in the model's training data.

If the previous conditions are met, I believe it should be possible to grant copyrights to works created using generative AI so long as the would-be copyright holder could definitively prove that no infringing works were utilized at any stage from training to completion. For example, an artist who trains their own AI model using their own works should clearly be capable of claiming copyright on the output of their model, and indeed, the model itself. Similarly, models trained only on works in the public domain should produce copyrightable works.

In other words, simply using an AI model should not be considered sufficiently transformative in its own right to grant a new copyright to a work–the creation of the model itself is an infringement without authority to utilize all works in the training data. Thus, creators of an infringing model should be liable for relevant damages for each unauthorized work used in the training data. Likewise, if a user intentionally uses such an infringing model to create works resembling those of an artist who did not authorize the use of their works in this manner, and seeks to mislead others that the model's output is a genuine work by the original artist, that user should be liable for infringement for any unauthorized works thusly created.

I hope that these comments provide a useful perspective on the topic of generative AI, and I thank the reader for your time and understanding.

[1] Generative AI – What is it and How Does it Work?
[2] OpenAI Used Kenyan Workers on Less Than $2 Per Hour: Exclusive | Time
[3] What is Overfitting? - Overfitting in Machine Learning Explained - AWS
[4] Making AI Forget You: Data Deletion in Machine Learning