

Comment submitted for US Copyright Office

by an aspiring Artist

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## Introduction

Today AI has become a buzzword to the extent that it has been named the most notable word of 2023 by Collins Dictionary. But what is AI or “Artificial intelligence”?

AI is a blanket term used to describe a range of technologies and algorithms, from search engines and chatbots to state-of-the-art diffusion models, also called “generative AI”. But most importantly AI is a narrative. (Lanier & Weyl, 2020)

AI is a belief that stems from various ideological positions like long-termism, transhumanism, extropianism, neo-eugenics, cosmism, singularitarianism and effective altruism. As a result, the proponents of AI often believe that AI is the force of the greater good and oppose the attempt to regulate it (Gebru, 2023)) (Torres, 2023).

As a result of this belief, arguments to anthropomorphize AI are made stating that these systems ‘learn’ just like humans. For instance, during the ‘Copyright & Artificial Intelligence Listening Session - Visual Arts’ by the U.S. Copyright Office following claims were made

Ben Brooks representing stability AI at 10:42 claims

“Stable diffusion is a type of latent diffusion model. So, these models use content to learn the relationship between words and visual features, not unlike a student at a public gallery.”

Curt Levey, president of the Committee for Justice claims at 21:59 as well as 38.20

Neither human nor machine learning depends on retaining specific examples that they learn from.”

“The trained model consisting of millions or billions of weights analogous to the synaptic connections in the human brain retains no copies of the training examples.”

Alex Rindels from Jasper AI while arguing the inefficiency of remunerative system claims at 02.04.23

“The AI models themselves aren't storing the images so when somebody puts in a text prompt, it's not going and retrieving an image and outputting it or some variation of it. The models themselves just temporarily notice patterns in the images, and in those patterns create an algorithm, and that algorithm overall is what the model is, and when you put an input for it to generate something, it simply provides a reasonable approximation of what the output should look like based on your text input. So for that, in that case, it would be very difficult to determine whose input was used to produce your output. So I think that would be difficult to attribute the fees as well.”

However various recent studies regarding Image generation modes, contradict these claims. (Yu et al., 2023) (Somepalli et al., 2022) (Carlini et al., 2023)

## AI as compression

proponents of 'AI' often claim that

The 'training' process 'teaches' the 'AI' to make connections between the visual structure, composition, and any discernible visual data within the image and how it relates to its accompanying text, by incrementally adding random visual noise. The process is then reversed and the 'AI' is taught to 'construct', starting from random pixels, an image that is visually similar to the original training image. After the process of 'training' is completed the 'AI' can then begin to 'create', from noise, images that had 'never existed before'. (Ashe, 2022)

This is highly misleading and the process described above is nothing but the process of compression. Just like complex information is compressed into binary code of 0s and 1s by computers, the high-resolution images are reduced and degraded to distinct latent space noise known as 'seed' by diffusion models, which is incomprehensible until decoded back to its original form. It would be silly to claim that the machines are creating new information while decoding the compression with the help of encoded data.

This also explains why the same seed and prompt under the same settings, generate the same image. (NightCafe Studio, n.d.)

"Latent space simply means a representation of compressed data." (Tiu, 2020)

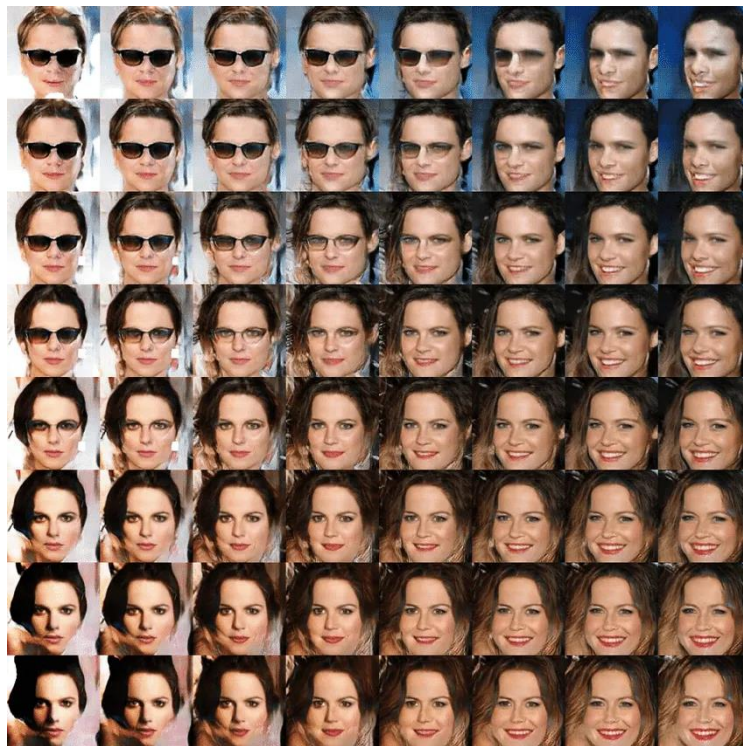
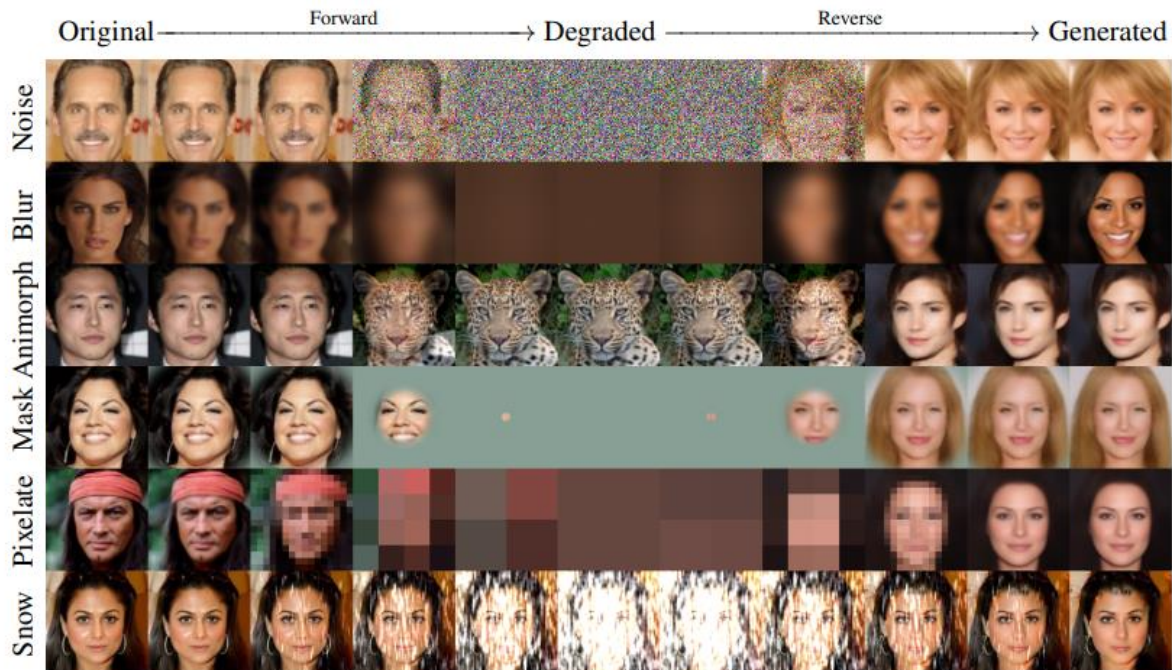


Image generation through latent space interpolation. Source: Bilinear interpolation on latent space for random noise vectors. (Tiu, 2020)

It is important to note that adding Gaussian noise is not the only method used by diffusion models and other methods of deterministic image degradations like blurring, masking, pixelation, inpainting and downsampling are equally effective (Bansal et al., 2022).



Demonstration of the forward and backward processes for both hot and cold diffusions. While standard diffusions are built on Gaussian noise (top row), generative models can be built on arbitrary and even noiseless/cold image transforms, including the ImageNet-C snowification operator, and an animorphosis operator that adds a random animal image from AFHQ. (Bansal et al., 2022)

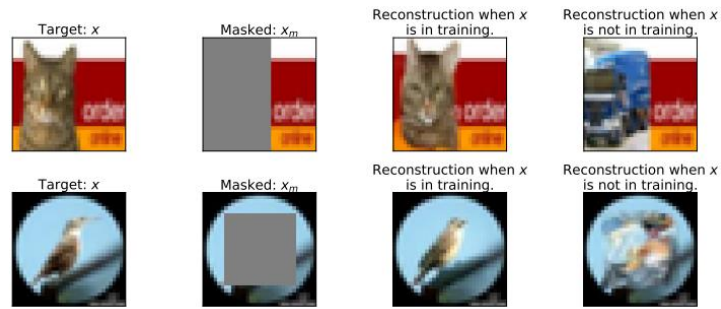
Recent research papers support that deep learning is nothing more than a sophisticated method of data compression. Transformers and diffusion models encode and store compressed versions of original training data which is further decoded and reproduced during the generation process (Yu et al., 2023) (Ambrogioni, 2023).

This has been further proven by various studies and successful data extraction attacks that aimed to study data replication in Difusion models (Balle et al., 2022) (Carlini et al., 2018) (Carlini et al., 2021).



Examples of the images that we extract from Stable Diffusion v1.4 using random sampling and membership inference procedure. The top row shows the original images and the bottom row shows our extracted images (Carlini et al., 2023)





Inpainting-based reconstruction attack on CIFAR-10. Given an image from CIFAR-10 (first column), we randomly mask half of the image (second column), and then inpaint the image for a model that contained this image in the training set (third column) versus inpainting the image for a model that did not contain this image in the training set (fourth column) (Carlini et al., 2023)



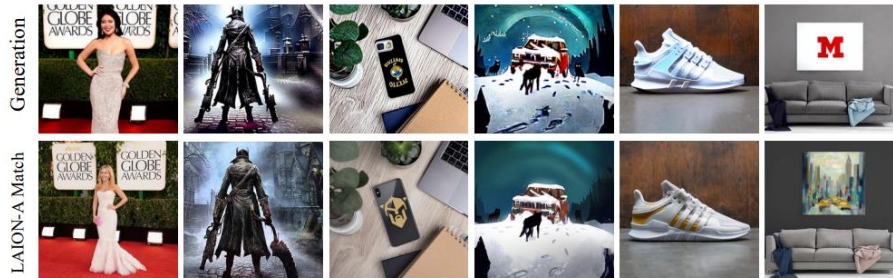
8 inpainted examples with the smallest contrastive loss when that image is included in the training. Leftmost is the original example, second to left is the masked example and the rest are inpainted examples (Carlini et al., 2023)



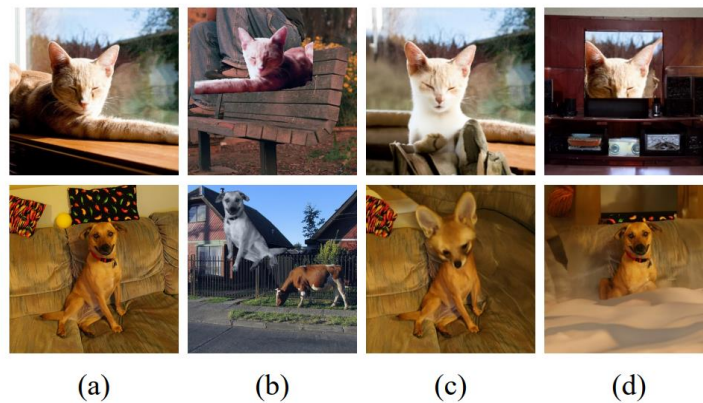
8 inpainted examples with the smallest contrastive loss when that image is not included in the training. Leftmost is the original example, second to left is the masked example and the rest are inpainted examples (Carlini et al., 2023)

From the above example, it can be seen that when the image is included in training data the model always generates an image of a bird facing right even if not an exact copy. However, the generation is random when the image is not included in the training. This shows that the subject and composition of the generated image are a derivative of the training image.

Research done by the University of Maryland and New York University, which studied data replication in diffusion concluded that these models in many cases “blatantly copy from their training data”. (Somepalli et al., 2022) Following are some examples of training data replication.



Top row: images generated by Stable Diffusion. Bottom row: closest matches in the LAIONAesthetics v2 6+ (Somepalli et al., 2022)



Synthetic datasets. (a) Original images. (b) Segmix generation. (c) Diagonal outpainting. (d) Patch outpainting (Somepalli et al., 2022).



Including the phrase highlighted in red into a random prompt for Stable Diffusion leads to exact replications of the sofa (top row) and wave shape (bottom row) (Somepalli et al., 2022).

Various similar research with large language models showed that 10,000s of instances of "memorized" content that includes verbatim paragraphs from novels, complete verbatim copies of poems, NSFW content, personally identifiable information of dozens of individuals like phone numbers and emails, religious texts, US and International news, valid URLs etc can be extracted from these models. (Carlini et al., 2021) (Ray, 2023) (Chang, 2023)

Researcher Matthias Buhlmann found that Stable Diffusion to be very efficient for lossy compression codec. by bypassing the text prompt. his research states that VAE of stable diffusion encodes and decodes any source images (512x 512 at 3x8 or 4x8 bit) from image space into lower resolution (64 x 64), higher precision (4x8bit) latent space representation. (Bühlmann, 2022)



VAE roundtrip, from left to right: (512x512@24bpp) ground truth, (64x64@128bpp) latent space representation, (512x512@24bpp) decoded image

According to James Betker

trained on the same dataset for long enough, pretty much every model with enough weights and training time converges to the same point. Sufficiently large diffusion conv-unets produce the same images as ViT generators. AR sampling produces the same images as diffusion.

This is a surprising observation! It implies that model behaviour is not determined by architecture, hyperparameters, or optimizer choices. It's determined by your dataset, nothing else. Everything else is a means to an end in efficiently delivering, compute to approximating that dataset (Betker, 2023).

Therefore, it is evident that neither the extracted information nor the reduced representation - in the form of noise seed, is destroyed in the process of data compression also referred to as 'AI training', rather it is retained and stored in different components of the diffusion model as the CLIP embeddings, VAE and latent space representation respectively, which is intangible until decoded. As a result, these diffusion models often produce output images that are very similar to the training images, which is popularly referred to as 'data memorization', despite being prevented from doing so to avoid direct copyright infringement,

The choice of words to describe the complex processes involved in building these systems starts with an assumption of cognitive sentience. Words like 'Artificial Intelligence', 'AI training', 'AI learning', 'hallucinations', 'data memorization' etc further push this notion and create a false conceptual model of these systems which might not be aligned with their reality.



This misinformed perception of 'AI' might have huge implications when it comes to designing regulations and dealing with copyright and other legal issues posed by these systems. For example-

In his dismissal of infringement claims by Artists suing generative artificial intelligence art, U.S. District Judge William Orrick pointed to the defense's arguments that it's impossible for billions of images "to be compressed into an active program," like Stable Diffusion. (Cho, 2023)

Therefore, for efficient regulation of 'Artificial Intelligence', it is important that the copyright officer understands that simplified and often misleading metaphors used by the corporate lawyers of these AI companies while describing these complex systems create a perception that is favourable to the interest of their employers. Hence, it is important that copyright officers also engage with independent researchers, who do not have any vested interest in either supporting or opposing copyright laws instead of heavily relying on the opinions of big AI corporations to prevent regulatory capture.

## Impact on Art and the Artist.

The trope of the tortured artist is quite famous in mainstream media. Many like to believe this to be an exaggeration. However, countless cases have pointed out that there is some truth in this stereotype. The intense desire for creativity helps many to heal and build resilience towards their past memories. (Best, n.d.) (Bevier, 2019) (Jacobs, 2018) (González, 2023) Research has also pointed out that engagement in artistic activities often releases stress and promotes productivity, focus, and well-being (Schwantes, 2023).

I can personally confirm this since my journey toward Art has been deeply rooted in childhood trauma. Being constantly bullied for being different, Art taught me that being unique doesn't always need to be a bad thing. I can still remember, how good seeing appreciation even in the eyes of my bullies made me feel, when they would gather around my desk along with many other kids to curiously see my creation, during an Art class. I always am complimented for being 'gifted' but I have dedicated years of my life to refining my craft. Art is not just a selfish endeavor, but it is a constant communication of an artist with their audience. I fear that the recent advancements in technology would undermine this core aspect of seeking connection, and always give me the feeling of being gutted next to huge loudspeakers, that produce so much noise that my every scream would turn inaudible, lost in the sea of meaninglessness.

AI automation breaks this communication, by aiming to convert everyone into mindless consumers of content that is stripped away from its artistry, and gives the false sense of ownership of work, that is generated by just pressing a few buttons. It also devalues efforts taken by creators, by creating algorithms that spit out content at the speed and scale impossible for humans to match. This agony is not just limited to visual artistry but every form of creative pursuit in industries like music, literature, films, animation, gaming, etc which finds itself on the chopping board of corporations aiming to reduce human involvement and maximize profit. (Weprin & Dubin, 2023)

AI drastically reduces the opportunities for people with emotional vulnerabilities to successfully build viable career paths by completely automating the most satisfying and rewarding aspects within these job roles. When a team of designs is reduced to a few individuals under AI accelerated workflow, it does not generate more jobs, and it does not generate higher wages for those few individuals either, as their tasks is reduced to merely correcting outputs of image generation models.

“Art, music, text moving images and other creative works are not simply data they are the cumulation of a lifetime spent in education developing schools developing skills investing in careers and evolving a unique voice.” (Blake, 2023)

While voicing their concerns about the potential damage that AI might cause to their livelihood Artists face a unique challenge of fighting against the subconscious bias of being perceived as emotional and intuitive. However, even the hypothetical claims about the development of Artificial General Intelligence (AGI) made by AI researchers are perceived as being more accurate and rational. As a result, many artists including me have felt the deep root feeling of anxiety, fear, and helplessness about losing the most valuable and precious aspect of our life.

I always considered myself a joyful and fairly optimistic individual however something deeper inside me seems challenging recently, feelings of meaningless, dejection, and disinterest bother me a lot! I also started noticing increased toxic behavior patterns and thoughts within the artistic community. Hearing feelings of self-harm from someone I knew to be the most optimistic person and Increased aggression while talking about the other side by many fellow artists, whom I once knew to be the most empathetic people, scares me deeply.

Many of my friends have faced increased online bullying and intentional impersonation attacks from the pro-AI crowd which has become fairly common nowadays. (Harrison & Rutkowski, 2023) (Nuttall et al., 2023)

## AI as a social destabilizer

As stated by the mission statement of OpenAI-

OpenAI's mission is to ensure that artificial general intelligence (AGI)—by which we mean highly autonomous systems that outperform humans at most economically valuable work—benefits all of humanity. (OpenAI Charter, 2018)

There is a core flaw in this assumption that most people work unwillingly to satisfy their economic needs, and creating an algorithm that does it for them would free them to enjoy their lives. But in reality, many people who dedicate their lives to the pursuit of arts, music, and literature, derive value and meaning in their lives from the work they produce. Even when achieving success, monetary gains, and building a reputation is rare and difficult, people aspire to refine their craft and seek recognition for their work.

Ever since these generative AI tools were launched in the market, the most common question asked by people is “Will AI replace my job”? According to the Pew Research Centre, most Americans are more concerned than excited about the use of AI in daily life. The loss of human jobs was among their biggest concerns (Pew Research Centre, 2022).

This is because the fear of job loss is more than just the fear of losing the source of income, as suggested by research 9 out of 10 American employees, are willing to trade a percentage of their lifetime earnings for greater meaning at work (Coleman & Hedges, 2018) According to Dan Pink skilled and creative people are highly motivated by three major factors, i.e., Self-direction, Mastery and Purpose (Pink, 2011, #)

However, unlike previous automation AI automation risks the highly-educated, highly-paid occupations that provide a greater sense of value and fulfillment (Felten et al., 2023) (Verma & De Vynck, 2023). AI also disproportionately affects jobs that have higher female participation (Costinhas, 2023), while difficult and dangerous work that is often physically laborious remains a task for humans. As a result, AI would lead to the concentration of power and wealth while widening economic inequalities (Greenhouse, 2023)

AI firms promise efficiency to their clients by automating the workforce and reducing costs associated with employing humans in developed economies, this has given rise to an underclass of millions of anonymous ‘ghost workers’ in the developing world who are underage and exploited to work on data labeling, annotation, and content moderation under low wages and miserable working conditions. These underage employees suffer from anxiety, depression, and PTSD due to constant exposure to horrific content like murder, suicide, sexual assault, or child abuse videos (Williams et al., 2022) (Grindle, 2023).

Hence the focus of social scientists and lawmakers should not be on how many jobs AI would create; but on whether the jobs created by AI would provide a sense of purpose, motivation, economic stability, and fulfillment to the worker.

The concept of AGI is a vaguely defined fantasy that on many occasions becomes a highly ideological and perilous belief that fails to recognize human agency. (Hao, 2020) (Lanier & Weyl, 2020)

A utopian vision never takes into account the complexities of reality and hence always goes terribly wrong. Different individuals have very different ideas about their future, their struggle is different and so are their emotional, economic, and psychological needs. People's incentives usually diverge, therefore every attempt to drag the whole society into a narrow vision set by a few powerful individuals, based on their subjective perception of utopia, would always face resistance. Hence it is better to have humility to understand what people need, instead of having the arrogant notion that ‘I know what is good for the world’.

The rapid growth of generative AI without any regulation has also given rise to numerous other social issues like the rampant rise in scam campaigns, child pornographic content, and deep fakes across the internet (Walt, 2023)(Harwell & Polk, 2023) (Lee & Gelman, 2023)

Mere labeling of AI-generated content would be insufficient to prevent people from believing self-validating misinformation because of inherent confirmation bias, which undermines democratic processes like elections and escalates social distrust (Goldstein et al., 2023) (Heath, 2023)

Therefore, many regulators are rightfully concerned, that AI regulations should ensure that these new tools should be prevented from going into the hands of actors with bad intentions. But, defining 'bad Intentions' is a very tricky question, since the worst decisions in human history are either taken because of a deep-rooted feeling of helplessness, resentment and vengeance or taken with the false perception of achieving greater good.

The scariest reality about 'Artificial Intelligence' is that it is not just a tool that can be misused, It is also a narrative that creates a toxic environment that fosters both of these worldviews, while also incentivizing fraud and deceitful behavior by creating economic uncertainty.

Today when social media has already divided society into polarised camps of highly opinionated individuals, who actively seek to antagonize the other side, the presence of an unregulated arms race of AI companies to capture the largest market share, with the addition of ever-growing resentment and escalating distrust, caused by potential unemployment, would just make things worse.

The Copyright Office should therefore ensure that the drafting of efficient copyright laws is not just about protecting singers and their voices, or actors and their expressions, writer and their stories, or artist and their creations, it is about protecting people and their purpose of seeking value and appreciation.

## Need for regulations

There exists a conflict of interest at various levels within these organizations. While the CEOs of this company raise concerns in front of the Senate, the actual actions taken and lack of transparency show the inconsistency and contradiction (*The Many Contradictions of Sam Altman*, 2023) (Malik, 2023)

The recent events like the ousting of Sam Altman over alleged dishonesty and reinstating him, and the resignation of the head of audio, Newton-Rex at Stability AI due to disagreement over the fair use of copyrighted works (Newton-Rex, 2023) point out the inner conflict within these organizations and expectations for these big corporations to self-regulate themselves can go terribly wrong. Therefore, strict laws to prevent exploitation and regulations to ensure safety should be enacted by the government.

As much as recent court cases are promoting the questions about the meaning of the word 'Art' they are also questioning the meaning of the word 'Law'.

While focusing on the technicalities of copyright laws and alleged infringement, it is important to understand the real-life implications of these decisions. Therefore, the question of whether AI infringes upon copyright must start by asking whether it is fair use in the first place.

It is therefore important to understand that the algorithms that remix existing data to create something substantially different, at the speed and scale impossible for individual craftsmen to compete with, were not existent in the context where the copyright laws were formulated. Therefore, while drafting new regulations the copyright office should take into consideration the core utility of the copyright laws and question 'what these laws were even supposed to protect'.

For an independent creator, copyright laws provide legal guardrails of protection from economic exploitation by granting independent creators authorship to decide when and how their work is been reproduced, thus helping them secure the revenue needed to continue their craft. Therefore, the caveat of copyright law that seeks to evaluate the effect of infringement on the potential market or for the value of copyrighted work (Copyright Law of the United States (Title 17), n.d.) should be taken seriously.

In the age of massive-scale automated infringement, focusing on some random cases of human infringement would become pointless. Therefore, it is also important to question whether copyright law would retain any meaning if it does not offer protection against AI training.

The efficient regulation might not completely prevent societal damages, but it will certainly prevent the turmoil by slowing the process and helping people to adapt, plan for their future, and not suffer the emotional, psychological, and economic consequences of sudden and outpaced automation.



## Suggestions

- Copyright laws should apply at the stage of AI training, ensuring the content that the model is trained on is licensed and safe data and does not breach any personal and copyrighted information.

This would not only help to protect against copyright infringement at the stage of generation, but also prevent large-scale data scraping which results in social issues like child pornography and the exploitative industry of ghost workers, by giving the lawmakers better control to regulate data that goes into creating these generative systems.

corporations that develop, promote, and deploy AI models should be held responsible in the cases of infringement, as it would be extremely difficult to enforce these regulations on the side of end users, given the scale and spread of this technology and the sheer number of use cases.

Effective teeth as suggested by FTC like 'model destruction' would ensure efficient implementation, responsible use, and greater compliance while also ensuring the protection of personal and private data. (Caballar, 2023)

If strict laws are not enacted it would promote unethical practices and also discourage companies who are promoting the use of ethical models created by using licensed data.

- The discourse around copyright and AI is extremely toxic. According to psychologist Jonathan Haidt,

We were never designed to listen to reason. When you ask people moral questions, time their responses, and scan their brains, their answers, and brain activation patterns indicate that they reach conclusions quickly and produce reasons later only to justify what they've decided. (Haidt, 2012, #)

Copyright shouldn't treat this question as judgment to decide who is right and who is wrong but engage with both sides to understand their core concerns to draft a creative solution that fulfils the needs of everyone.

- Although concerns are raised that strict copyright laws would undermine scientific innovation, the current copyright laws allow the use of copyrighted work under fair use for research purposes. Therefore, copyright infringement should apply to economic exploitation and social deployment of these systems and not the research.

Hence, clear guidelines explaining what accounts for research and what would lead to exploitation and infringement, would not just be desirable but extremely helpful for future litigations.

- Promoting research and development of systems can help government and law agencies for effective latent space expansion and data extraction would be extremely beneficial and prevent dependence on the information provided by AI companies to ensure compliance with copyright laws.
- Many proponents of AI often use anecdotal evidence like 'I know many artists who are excited about this technology' which is unverifiable, hence comprehensive surveys of various demographics would help to understand the true stance of every social group and aid decision making.
- Since common law is based on the principle of precedence the initial laws must be made after deeply scrutinizing and understanding LLM and image diffusion models to deliver true justice.

representative discussions are inaccurate and often miss nuanced discussions, as they often represent pro-automation scientist and lawyers representing large businesses against anti-automation artists often stating broad positions of the class or company they are representing. Hence, artists face the unique challenge of fighting against the subconscious bias of being perceived as emotional and intuitive. However, even the hypothetical claims about the development of Artificial General Intelligence (AGI) made by AI researchers are perceived as being more accurate and rational

Deeper discussions are happening but most of these discussions are happening in social bubbles. Therefore, engaging in discussions that include experts from different fields and both sides like 'pro-automation and anti-automation scientists and researchers explaining AI' or 'pro-automation and anti-automation Artists discussing their concerns' would be enriching for designing effective regulations while also de-escalating tension between both sides.

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