

Torgeir Volden

Bachelor's thesis

Artificial Intelligence and Art

Foul Play or Future

May 2023

NTNU

Norwegian University of Science and Technology

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1 - Introduction

“Everybody has their own definition of a work of art, [...] if people find it emotionally charged and inspiring then it is” (Lloyd as cited in Miller, 2020, p. 121). In September 2022 journalist Kevin Roose posted an article in the New York Times about how an artist by the name Jason M. Allen had won the first prize for emerging digital artists at a Colorado state fair, with his picture *Théâtre D’opéra Spatial* (“A.I.-generated picture won an art prize. Artists aren’t happy,” 2022). The image sparked controversy when the fact that it was made with the AI generative tool MidJourney reached the public, even though it was stated in his application, and the discussions have reached new heights in the past year due to the rapid development of the technology surrounding AI. Some of the main points of the discussions that have arisen are the questions of authorship and copyright, which is what I will be focusing on in this text. Authorship is in question due to the notion that AI is a being in and of itself, therefore the art created with it belongs to that AI. I propose that there is more nuance to this, and that the AI can’t (at least not at the point of writing) operate completely autonomously, needing both the coding and ideas of humans to produce art. Following this question is the question of copyright when it comes to the art made by AI. The AI is trained on images collected in large datasets, which are often collected without the consent of the artist. Throughout this text I will start on the topic of algorithmic art with a brief introduction of the history of AI, followed by looking at the stories of AI pioneers such as A. Michael Noll and Harold Cohen, as well as looking at the case of *Edmond de Belamy*. Through these cases the text will take a closer look at the questions of authorship and copyright when it comes to art made with AI. After the introduction into algorithmic art, we will move on to the more modern diffusion model which is being used today for generative art.

2 - Algorithmic Art

2.1 A brief history of AI

The history of AI is a long one, and it is hard to pinpoint exactly where it began (cf. Manovich, 2023, p. 34), but for the scope of this text I propose it as starting in 1956 when a group of scientists and mathematicians gathered at Dartmouth College, NH, to discuss whether it was possible to simulate the human mind. The question whether a computer could mimic the brain was proposed by psychologists working with cognitive science, with notable scientists behind this movement being Allen Newell and Herbert A. Simon (cf. Miller, 2020, p. 37). This meeting was where the term Artificial Intelligence was coined by psychologist

John McCarthy, and where Newell and Simon presented the first program designed to simulate human-like problem-solving called the Logic Theorist (cf. Miller, 2020, p. 38). From this meeting onwards AI has been used for many different feats such as Joseph Weizenbaum's ELIZA, a program written for psychoanalysis and was meant to "talk" to patients using pre-set replies to certain keywords (cf. Miller, 2020, p. 41); IBM's Deep Blue, who beat the chess world champion Garry Kasparov in 1996/97 (cf. Miller, 2020, p. 46); IBM's Watson which became the Jeopardy! champion in 2004 (cf. Miller, 2020, p. 48); or Google's AlphaGo which became the go world champion in 2017 (cf. Miller, 2020, p. 50). To elaborate even more we can take a deeper look at Google's AlphaGo which became the world champion. As stated, before it became the world champion in 2017, it did so after being trained on thirty million moves based on games by masters of the game (Miller, 2020, p. 51). But, after only months AlphaGo Zero was released, entirely self-taught, only being given the rules of the game. After forty days of training against itself it beat its predecessor, the world champion AlphaGo (Miller, 2020, p. 52). This is just one of many examples of the pace that the AI field is currently moving, though a lot of the progress is happening behind locked doors. Sam Altman, one of the people behind OpenAI (the creators of DALL-E 2), has also responded to an open letter about a six month halt in AI development saying that he felt the letter itself missed some, of not most, of the technical nuance of where the halt needs to happen, but he agrees that moving forward they need to "[move] with caution and increasing rigor for safety issues." Altman was also pressing the importance of openness when it comes to the development process (Altman cf. Sterling, 2023).

2.2 The case of A. Michael Noll

The first example of this I want to point out in the story of AI art is the story of A. Michael Noll who in 1965 discovered a bug in a plotter for the IBM 7094 machine which caused it to draw random lines instead of outputting a graph for the IBM machine. This spurred Noll to pursue making art with machines deliberately (cf. Miller, 2020, p. 40). This relates to the stated question in the introduction, namely; who is the author of machine or AI created artworks? In the case of A. Michael Noll, he tried to copyright the artwork drawn by the IBM plotter but met resistance in the regulatory organ the Library of Congress due to the artworks being made using a computer, or "a mere number-cruncher" (Miller, 2020, p. 40). Noll finally got his copyright after insisting that the software used to instruct the plotter was written by a human, therefore the art was also made by a human. The AI can be seen as an

extension of the human and copyright can therefore be claimed by the programmer that made the AI. This reasoning was enough to convince the US regulators, at least in the 1960s, early '70s, setting an early precedence for the field, even though these artworks were in large not based on the training from millions, if not billions, of images (cf. Miller, 2020, p. 40). From A. Michael Nolls plotter we will move on to a more purpose-built machine, namely Harold Cohen's AARON.

2.3 Harold Cohen & AARON

AARON was a project of Cohen's that started in 1968, which he continued to develop and refine until 2016 ("Harold Cohen shows and exhibitions," n.d.). The machine was made to randomly assemble an assortment of different elements into attractive images, or pastiches (Miller, 2020, p. 40), and had more elements of machine learning and AI implemented as the technology advanced giving AARON an increased autonomy in producing images (Elgammal, 2019, p. 1). It might not be comparative in quality or content to what today can be recognized as AI generated art, but it was nonetheless a machine creating art. Even if AARON was able to create artworks, Cohen was reluctant in calling the program itself an artist, and rather chose to put emphasis on the collaboration between the machine and the human saying that "Creativity... lay in neither the programmer [sic] alone nor in the program alone, but in the dialog between [...]" (Cohen as cited in Audry & Ippolito, 2019, p. 1). This sentiment is echoed by Blaise Agüera y Arcas who thinks that "when we do art with machines [there isn't] a very strict boundary between what is human and what is machine" (Agüera y Arcas as cited in Miller, 2020, p. xxiii). Bruce Buchanan also said "[it] will never make a choice to break the rules, nor will it reflect on those constraints as something it might want to change..." about AARON, enforcing the sentiment that AARON is a machine, or a tool, made for a specific purpose (Buchanan as cited in Audry & Ippolito, 2019, p. 2). AARON is an early example of what Ahmed Elgammal calls "algorithmic art", a process which requires detailed code to be written for a desired visual outcome (cf. Elgammal, 2019, p. 1). Even the artists who have worked with the early stages of AI art are cautious at calling the machine itself an artist, they are using it as a tool or as an extension of themselves, thereby claiming authorship of the artworks themselves; this will be discussed further throughout the text.

2.4 Edmond de Belamy & adversarial networks

If we look at a more recent example, we can look at that of the *Portrait of Edmond de Belamy* (see figure 1). Edmond de Belamy is a creation by the French artist collective Obvious in 2018 (Miller, 2020, p. 119). The picture in question was made using a purpose-built GAN, trained on fifteen thousand classical portraits from the WikiArt dataset, and they “signed” the image with the algorithm used to create the image (Miller, 2020, p. 119). A GAN, or Generative Adversarial Network, is a network-model created by Ian Goodfellow in 2014 at the University of Montreal (Miller, 2020, p. 87). It is composed of two “actors” working against each other, hence adversarial. One actor, the discriminator, is trained on real life images, paintings and so on chosen by the artist, while the other, the generator, creates shapes out of latent space. Latent space is a compressed representation of data where it stores patterns allowing it to recognize and categorize different elements. These images are then sent to the discriminator to check if what has been created is realistic based on what it has been trained on. This is a back-and-forth process where the pictures are evaluated repeatedly until the generator has learned enough to create a realistic enough image. One could think of it as a “two steps forward, one step back” operation until the wanted results are created, as the generator - after getting a fail or pass from the discriminator - does not go all the way back to latent space every time, but now rather has some shapes to continue building upon (Miller, 2020, p. 89). There also exists something called a CAN, or Creative Adversarial Network, created by Ahmed Elgammal and his team which works in a similar way. It is based on GANs but rather than having the generator create something that is like that which the discriminator is trained on, CANs have the generator create something that is not like that which the discriminator is trained on, in a way simulating how one could imagine artists digest prior works until they break out of established styles and create something new (Mazzone & Elgammal, 2019, p. 3), deviation from the known is encouraged (Mazzone & Elgammal, 2019, p. 5). Although the CAN is trying to create something new or novel, it also adheres to Colin Martindale’s principle of least effort, where he argues that too



Figure 1: *Portrait of Edmond de Belamy* by the Obvious collective (Obvious, 2018)

much novelty will turn off viewers, thereby ensuring that the resulting artwork is novel but does not stray too far from what is accepted (Elgammal, 2019, p. 3).

Edmond de Belamy is a made-up character and part of a collection of eleven pictures in total of the fictional Belamy family. What is so significant about this portrait is the fact that it sold for \$432,500 at an auction with Christie's in New York (Elgammal, 2019, p. 1), helping legitimize AI generated art. The astounding prize claimed by the portrait of Edmond de Belamy has been met with criticism, with some even claiming that the Obvious collective are not true artists, but "mere marketers", and Mario Klingemann said that both Obvious and Christie's showed a "lack of judgment" with the sale (Miller, 2020, p. 121), before selling his own AI generated art in March the next year (Miller, 2020, p. 122). The group themselves have goals to democratize GANs and that they want to legitimize art created using AI tools (Miller, 2020, p. 120). When it comes to images such as Edmond the Belamy, the discussions at the time seem to avoid the topic of authorship and copyright. While the Wikipedia page for the WikiArt dataset states that the dataset contains both public domain and copyright protected images ("WikiArt," 2023), none of the articles used as a base for this text mentioned whether Obvious had the rights to the images they used to train the GAN or not, nor did they pose any issue with this, only Arthur I. Miller dedicated about half-a-page to the topic before moving on (Miller, 2020, p. 121). This highlights the second question presented in the introduction; the issue of copyright when it comes to the use of datasets, and it is an issue we will look closer at in the context of diffusion-made images.

3 – Diffusion

3.1 What is diffusion?

In the past few years, the technology surrounding art generated by AI has evolved into the diffusion method used in today's powerful tools such as Stable Diffusion, DALL-E 2, and the maybe more (in)famous MidJourney. All this was made possible by the text-to-text generator GPT-3. Following GPT-3's success the CLIP-model (Contrastive Language-Image Pretraining) was made, making it possible to generate large quantities of images with captions, streamlining the workload for classifying images (cf. Dehouche & Dehouche, 2023, p. 2). This availability of millions of pictures with text pairings opened the doors for AI to become as sophisticated as they have with the creation of very large datasets. MidJourney is the tool used by Jason M. Allen to win the Colorado State Fair's emerging digital artists award. It is an extremely powerful tool, and as with most other tools in the current age

iterations are coming at an alarming rate making the tools even more powerful. Recently MidJourney released their Version 5 further improving their coherency, how closely the generated image reflects the text prompt, the interpretation of “natural language prompts”, while also furthering their advanced features (MidJourney, n.d.). Diffusion as a method makes use of gaussian noise, a way to reduce image noise and to reduce the detail in images based on a mathematical formula, to learn how images decay, and this “removal of information” in steps is what teaches the model how to rebuild something from latent space (cf. Salvaggio, 2023, p. 86). As an example, if we fed an AI 10,000 images of images with the tag “tree” and let it train on this dataset, it will learn what typically is defined within the tag. From there we can then ask it to reproduce a “stereotypical” tree. The machine learns how the images break down when noise is introduced and from this it can then reproduce the steps in reverse order to create something that represents the prompt given (cf. Salvaggio, 2023, p. 86).

On the other hand, text-to-image generating is not completely a dance on roses. The “hands problem” as called by Amanda Wasielewski is something that is currently being worked on. It is a very well-known problem in AI tools where images of people often have hands with too many/few- or short/long fingers, having them blend into fabrics, clothes or other body parts causing everything from a comical effect to something akin to the “Uncanny Valley” effect (cf. Wasielewski, 2023, p. 72). The hands problem even spurred a meme on social media in the form of a “sixth-finger ring” for criminals causing any footage captured of them to be deemed as AI generated and therefore “inadmissible as evidence” (cf. Wilde, 2023, p. 14). There was also a prominent issue in the beginning when it comes to faces, the problems are mostly gone but depending on what the subject of the image is, there might still be some artifacts occurring. So, from this we can determine diffusion as a technology based on the science of decaying images when noise is introduced into them. It is still a technology that has some kinks that need to be ironed out, but with the rapid development that is currently taking place it is taking huge strides from week to week. In the end diffusion can be summed up as the “science of image decay”, learning how noise destroys images and learning patterns from that how to rebuild the different prompts, and it was made possible at such a large scale thanks to its text-to-text “cousin” GPT-3.

3.2 Datasets

The AI is trained on millions of images from what is called datasets. A dataset is a collection of elements that can be read and manipulated by a computer. One notable source of datasets being LAION, a non-profit organization that scours the internet for images, pairing them with associated text-pairs and releasing them for large scale testing. The organization have datasets ranging from 170 million images, up to the biggest dataset, LAION 5B, at a massive 5.8 billion pictures (*LAION*, n.d.). Some datasets might be curated, someone has manually picked the content to give it a certain quality control, on the other hand, there are non-curated datasets, where the data is collected en masse. In the case of non-curated datasets, the users who upload the pictures are largely the ones who caption the image. The obvious drawback to curated datasets is the sheer time it takes to gather, check, and approve each picture, compared to non-curated sets where you take what you find. It is also important to keep in mind that the datasets are collected within specific cultural, political, social, and economic contexts. Eryk Salvaggio even goes as far as calling the images generated by AI infographics of the underlying dataset and proposes that using an AI generator is in a way predictive and not generative (cf. Salvaggio, 2023, p. 84).

There is also a very pressing question when it comes to curated versus non-curated datasets, that of copyright. Having copyright as a tool builds on the narrative that creative labour gives the art an innate value based on the thought that individual genius is deserving of acknowledgment and reward (cf. Zeilinger, 2016, p. 18) and according to Garrett Hardin in his “tragedy of the commons” there is a lack of motivation to create art or engage in creative activities without a promise of reward or regulation (Hardin as cited in Zeilinger, p. 27). This being probably the most notable drawback of non-curated datasets where there is little-to-no regard for who the creator of the images gathered is. LAION say on their webpage that they simply index pictures on the internet and that they then proceeded to discard all the gathered images, leaving it to whomever want to use the datasets to recreate them in their entirety using the indexes and tools presented by organizations such as LAION, who recommend the *img2dataset* tool (“FAQ,” n.d.). After all, for the AI images only consists of numerical data, and it does not use direct elements from any picture but learns how things go together in a greater picture. Last year Forbes did an interview with MidJourney’s CEO David Holz, who uses pictures from the LAION database, where he said that when gathering such an amount of images there was no way to properly authenticate the origin of the images, therefore making it near impossible to seek consent from living artists or works under copyright

approach each artist about the rights to the works (cf. Salkowitz, 2022). Salvaggio points out a possibility to spot weaknesses and strengths in the datasets used to train the AI. Subjects or parts of the image that present with high clarity or as (close to) realistic could be considered strong features within the dataset, while parts presenting as smudged, blurry, distorted or glitched can be considered weak features (cf. Salvaggio, 2023, p. 90). This can be considered as one bias within the system as the representation within the dataset will to a certain degree decide what it can output. Another example is the way that fail safes are implemented into the system itself, Salvaggio points out that pictures of men kissing in DALL-E 2 have no issues with being generated, while images of women kissing are stopped as part of their filter of adult- or pornographic content. OpenAI have themselves admitted to this being the case, by saying “[w]e found that our initial approach to filtering of sexual content reduced the quantity of generated images of women in general”, they have since made changes to their filtering, but it is still not perfect (OpenAI as cited in Salvaggio, 2023, p. 94).

When the researchers, artists, or anybody then rebuild these huge datasets, they can be used by AI to learn certain aesthetics by analysing the images contained, and then using these to create new images that adhere to that aesthetic (cf. Elgammal, 2019, p. 1). Much in the way a human can look at anything and try to recreate it on a canvas or other media. Picasso is quoted by Steve Jobs saying: “Good artists copy, great artists steal” (Jobs as cited in Miller, 2020, p. 15), or as Miller put it more softly: “We are constantly absorbing the ideas of others.

They are stored in our memory banks and over time become our own” (Miller, 2020, p. 13). At the same time, ideas are not protected under copyright law (Zeilinger, 2016, p. 26). Picasso’s quote is of course putting it bluntly, but as humans we take inspiration, whether intentional or non-intentionally, from what we see and

experience. Philosopher Georg W. F. Hegel puts it like this in his theory: “Art (...) is a portrait of the human mind” (as cited in Hatt & Klonk, 2006, p. 24). Digitally created images usually have no way of identifying who the original creator is making copyrighting a hard task most of the time. The artist can place watermarks (a type of overlay used to signify ownership (see figure 2)) or signatures to try to hinder unsolicited use of their intellectual property, but in the end the tools available today to edit or remaster images makes this a

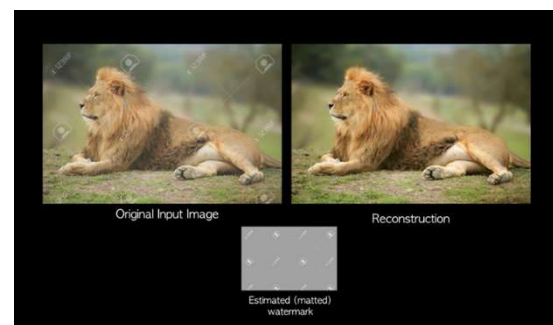


Figure 2: Image with and without watermark, having it removed with a purpose-built AI by Google (DigitalSynopsis.com, 2017)

wasted effort against those with “ill intent”, with even big tech actors like Google creating tools that identify and remove signatures or watermarks (DigitalSynopsis.com, 2017). There is also an inherent problem with digital images that is the ease of copying and sharing pictures on any device, from right-click copying on pc to something as easy as screenshotting an image on a touchphone. This is not a new problem either: “Copyability of intellectual property has been described as an existential problem for artists for decades, if not centuries” (Zeilinger, 2016, p. 29).

Even if illegal copying is almost unavoidable, it is important that copyright is upheld wherever possible. There are seemingly no current direct regulations when it comes to training AI using non-consensually attained art, at least nothing that’s been, but the community shuns it. Big corporations such as LAION which collect the datasets and index them are shuffling the responsibility on to the end user when it comes to the use of the copyrighted images they have collected.

3.3 Taking a stance

With the new strides within AI generated art and democratization of this medium, a greater population have access to software such as Stable Diffusion or MidJourney available at their home computers. The possibility of “harvesting” art from an artist you like on platforms such as Twitter or Instagram to use as a dataset to train their own generative AI is an increasing threat to the artists. This might be an even bigger problem in the fan-art sphere where art is generally thought of as a “gift culture”, often shared as part of a greater setting of worldbuilding and in general just fandom (Lamerichs, 2023, p. 157). In a sense this

community feeling is also much what drives the AI field too, being in its essence a social experience (cf. Ervik, 2023, p. 50). MidJourney specifically uses the social server-hosting software Discord as their platform of choice, hosting the creation of images in public servers where all users with access can see both the prompts used as well as the images the generator outputs for others using the service in real time making the experience undeniably social (Ervik, 2023, p. 49). This greater social experience is what has spawned memes such as the image series *Donald Trump Goes to Prison*, by Twitter user



Figure 3: "Balenciaga Pope" by Pablo Xavier (Balenciaga Pope, 2023)

@EHigginsMD (Higgins, 2023), or Pablo Xavier's viral *Balenciaga Pope* (see fig. 3) (Di Placido, 2023).

Nicolle Lamerichs mentions in a new article that multiple conventions have been publicly taking a stance against art created by AI at their cons, going so far as to ban AI created material from their promotional materials, exhibit halls, or artist alleys (Lamerichs, The conventions are comparing AI created art to bootleg or counterfeit goods, and in general it is seen as something unethical in the communities. This is a part of what Lamerichs points to as the subcultures trying to regulate innovations, this is a reaction to the lawmakers and official regulators who are struggling to keep up with the rapid progress within the AI field, and full fledged regulations might not come within the next decade.

The lack of regulation has caused the wider community to adopt certain hashtags on social media to try to combat the use of AI in artmaking, including #noaiart and #artbyhumans (cf. Feyersinger et al., 2023, p. 142). At the same time the situation is not made better by people abusing AI, such as one fan artist on the streaming website Twitch.tv who got the artwork they were making on stream copied and “finished” using AI by a viewer who went as far as claiming to be the original artist for the work (cf. Lamerichs, 2023, p. 157). Even if fanart is largely viewed as a gift culture, as mentioned before, copyright through the ages has been a way to attempt to legally allow the artists to control and limit the reproduction and circulation of artworks (cf. Zeilinger, 2016, p. 24). On the side of AI chatbots, Chat-GPT has been banned in Italy, as the first Western country, following user privacy concerns (cf. Mukherjee et al., 2023) and prominent figures within the tech industry are calling for a halt in the development of AI systems in fear that they are getting out of control (cf. McCallum, 2023). Some might even think society is approaching the technological singularity, a point where we enter a runaway self-improving cycle of AI.

The possibility to “steal” or copy the style of your favourite artists is accessible due to the availability of diffusion software on personal computers, as well as in larger datasets. By creating and sharing images on social media such as Twitter or with friends on Discord servers, users are contributing to a greater social experience surrounding the creation of images. The social collectives, such as conventions or different fandoms, are having to take pre-emptive measures restricting or even banning AI generated art due to the sluggishness of the regulatory organs within the field, comparing the art to that of counterfeit art or illegal imitations.

3.4 Existential competition

The collective Corridor Digital recently released an animated anime short film called *Anime Rock, Paper, Scissors* (Corridor Digital, 2023). The film standing at about seven minutes, feature two brother-princes who battle over succession to their father's kingdom using the game "rock, paper, scissors" or as they put it "rock, paper, crossed blades". They used real-life video to create anime lookalikes of themselves, together with anime-esque backgrounds, using the Stable Diffusion AI. They trained their AI using images from the 2001 anime movie *Vampire Hunter D: Bloodlust* thereby teaching it that animation style. Combining this with tools from traditional digital movie editing, they made a believable anime short film.

Niko Pueringer, one of the founders of Corridor Digital and writers of the short film, commented on the YouTube video that they were trying to use the tools at their disposal surpassing the usual need for "large studios and large budgets" (Corridor Digital, 2023). In the same comment he also addresses some of the controversy surrounding the release of the film, saying that they created this video to share their journey in exploring these new tools that have rapidly become available to the greater public. He also expressed understanding that change can be scary "especially if it feels like your passion or livelihood is on the line" and reclarified that they made it a point to be open about the source for images they used to train their AI and expressing the importance this (Corridor Digital, 2023). Of course, making something in the style of someone is not a breach of copyright, but being open about the source is positive, and in such a polarized discourse as AI today getting the goodwill from the public is always a plus. Feyersinger et al. presents the fear mentioned by the community as: "parts of the art community (...) regard the technology behind these new, AI-based tools as existential competition" (Feyersinger, 2023, p. 143). Reading further into the comments of the same video multiple animators have commented sharing their thoughts on the development of AI with mixed feelings. Some of the commentors expressing their fear of losing everything they've worked for, while others expressed feelings like "being glad" or even "excited" that there now are new tools available to them with reasonings such as off-loading tedious tasks or even having more personal projects be viable (Corridor Digital, 2023). On this topic it is important that we do not only focus on the negative possibilities that is feared to follow the implementation of AI technology, such as the perceived threat to human creativity and the traditional tools of expression, but also look at the possibility of AI as an important part of the creative process (Buchanan as cited in Feyersinger, 2023, p. 143).

The community is also reacting quite severely when it comes to the use of AI tools in general. Twitter user @TheYuanTwins posted: “We just had someone try to tell us we object to AI art because we fear progress. He is wrong on so many points – the first of which is we do not object to AI art; we loathe it with a religious fervor” (“TheYuanTwins,” 2023). Though the comment was not directed at Corridor Digital, the comment encapsulates a lot of the sentiment that the public has towards AI and AI-generated art, and seemingly a lot of it has to do with intent and effort. In an article by Nicolle Lamerichs, she interviewed illustrator and fan artist Karlijn Scholten who expressed the emphasis on wanting to buy art that “had a human behind it, whose art style and ideas [they] like” (Lamerichs, 2023, p. 160). Even though Karlijn wants art with what one could call “substance”, they do point out that great AI art does exist. Intent is one of the three qualities - together with imagination and unpredictability - that surround both creativity and genius according to Miller, the artist needs the desire (intent) to solve a problem (cf. Miller, 2020, p. 23). The German philosopher Hegel puts emphasis on “thought and subject matter over form” (as cited in Hatt & Klonk, 2006, p. 38), “thought” in this matter is what I propose we interpret as intent. There is an argument to be made when it comes to AI art and intent based on the need for the user to use prompts to generate the image they want to create. This is a process that Feyersinger et al. describes as “a wizard trying to find the right words of an unknown magic spell”, calling those proficient at this craft “prompt engineers” (cf. Feyersinger et al., 2023, p. 135). Although there is a difference in the effort between “writing a few words” into an AI’s prompt box, and spending hours, days or even weeks on painting a traditional painting, not to mention the time spent acquiring the skills necessary. I would argue that there is definitively intent behind the AI generated images (even if the intent is to just “see what happens”). Elgammal proposes it like this: “I would argue that the deformed faces [of GAN art] do not indicate a lack of intent because the intent lies in the process, even if it doesn’t appear in the final image” continuing saying “[a]lthough the final images might have surprised the artists, they didn’t come out of nowhere” (Elgammal, 2019, p. 2). The refining process of constructing “the right” string of prompts for what you want to create is also comparative to that of a dialogue (N’Diaye cf. Feyersinger et al., 2023, p. 141), or as Mark Riedl is quoted in Miller, “Humans have the goals and intent, while computers have the skills” (Riedl cf. Miller, 2020, p. 270). Riedl’s quote can be compared to that of an artist taking on commissions, getting a description of what the customer wants (prompts), then creating the given artwork based on their knowledge about the subject and their acquired skills within the given medium.

4 - Conclusion

The history of AI is a long one. Over the almost seventy years since the coining of the term Artificial Intelligence by John McCarthy, it has been used for many different purposes from medical work to defeating world champions in Go. The rapid evolution has in the past year gotten to the stage where professionals working within the field are discussing a halt in the development to get a better overview of the situations risks and benefits, causing OpenAI's Sam Altman to say they need to move with caution and be open about what is happening behind closed doors.

Michael Noll was in the '50s a pioneer for the computer-generated art field, convincing the Library of Congress to let him copyright images made with the IBM plotter, paving the way for many of today's artists and laying the groundwork for viewing computers as a tool to help with the creative process. While Noll used a piece of technology designed for something else, Harold Cohen made his tool AARON for the specific purpose of making (algorithmic) art, and it did so for almost fifty years. Cohen was very precise when talking about AARON as a partner in creating art, being reluctant to call "him" an artist, and rather putting an emphasis on the collaboration between human and machine, which is a sentiment shared by multiple people including Blaise Agüera y Arcas and Bruce Buchanan.

When the Obvious collective sold their collection of eleven portraits of the fictional Belamy family, they stirred the pot of what was accepted as art. Using a GAN to create something that can be sold for such a price at a respected auction house such as Christie's further establishing AI art. Obvious was met with criticism by actors within the AI sphere such as Mario Klingemann saying they lacked judgment when they decided to sell their art on the market, but later joined in the venture selling his own pictures. The GAN discussion also opened the question of copyright when they used datasets to train their discriminator parts.

In the current decade technology has moved on from the "GAN-era" and into the technological advances of diffusion. Being made possible due to the development of OpenAI's text-to-text generator GPT-3 and the accompanying CLIP-model they have enabled the training of AI using ginormous collections of image-text pairs. Diffusion being the "study of image decay" it learns from how images decay when noise is introduced, reversing the process from latent space, and creating a picture of "stereotypical" examples of what is prompted by the user. The technology is not without errors, and it has presented such issues as Amanda Wasielewski's "hands problem," or distorted faces, even though the community does have a fascination with these bugs spawning memes such as the "sixth finger ring". The

datasets can also be said to be the cause of some of the issues when it comes to hands, or distorted features in general, with Eryk Salvaggio proposing the images created are infographics of the underlying dataset, enabling us to determine strong and weak features within the datasets themselves based on what features in the image that present with high clarity, or realism, and what does not. The datasets also present the social, political, and cultural contexts that are promoted by the big social media platforms. This together with the built-in safety features of the software such as DALL-E 2's filtering of sexual content causing a reduced image quality based on gender, due to skewed social stigma of sexuality. Datasets themselves also furthers the question of copyright, with the large corporations collecting them are pushing the responsibility on to the people using their datasets rather than doing their due diligence when harvesting the images in the first place, claiming they "only index" the images and it's up to the end-user to sift through and use the images in an ethical way. There is of course Picasso's words regarding good artists to consider when it comes to how the AI uses the images it trains on, it learns the idea of how elements go together, and what the different elements look like from the prompts it has been trained on, based on data contained in the image. And then there is also the issue with trying to reach the artists behind millions, or billions, of images trying to get consent, when the images are "freely" available on the internet, and probably nobody would bat an eye if a traditional artist looked through the images and then went on to create something based on it.

In more recent times the public spheres where art is circulated, resistance is emerging against AI created art, though with conventions and fandoms starting to view it as counterfeit or bootleg, banning it from making an appearance in their locales. The community is divided with people on both sides, some trying to find a path for both "worlds" to exist, and others seeing opportunities to make some ill attained gains, such as the copying of artworks in progress on public platforms such as Twitch. The resistance to this kind of display often being presented in forms of online "mobs" using hashtags to publicly display their position publicly in the likes of #artbyhumans or #noaiart. The communities having to take "matters into their own hands" is a reaction to the official regulators not reacting quick enough to the developments being done within the AI field, especially over these past two-three years, and now big actors within the AI field are discussing a halt in development so that society might get some time to make sure due diligence is being made. Italy became the first western country to ban an AI bot when they in April banned chat-GPT, if only temporarily due to privacy concerns.

In late February, Corridor Digital released their new animated short. It spurred reactions when it came to the use of AI, but also brought forth some important points surrounding the topic. The first is openness of what is used as inspiration and training materials for the AI, so that the original work gets the recognition it deserves; for Corridor this was the 2001 anime movie *Vampire Hunter D: Bloodlust*. It also gave the creators the possibility to address some of the greater fears people might have when it comes to the rapid evolution of AI tools, such as the existential competition that Feyersinger et al. talks about in their article. The video also showed the polarization of the field when one looks at the comments, with a mix of relief and worry from actors in the animation trade.

Based on the story of Noll, Cohen and so many others, the question of authorship in AI generated art is not a clear answer, but looking at it as a collaboration between humans and the machine is probably the best way going forward. Letting the human have the intent, and the machine the skill needed to complete the idea. With the human as the one with intent, they should also be the ones who receives the rights to authorship over the final product. In instances like that of the Jason M. Allen's *Theatre D'opéra Spatial*, I propose that he should be eligible for the prize he was awarded. Moving forwards there might be an incentive to make separate categories for AI and non-AI art, but that is a question for the competition holders of the future to decide.

The copyright question of datasets on the other hand, is also without a clear answer. The big corporations are pushing the responsibilities over on the end-user of the indexes. There is, of course, the issue of finding each artist and asking their consent when gathering (in LAIONs case) 5.8 billion images, but it should all be done in good faith. The AI views the images as numbers, not directly using any element of the images it is trained on, much alike how humans view images and then create their own ideas. This creates a possible argument for the training of AIs, -or rather the datasets themselves- being a breach of copyright, while the end-product might not represent such a case. In the end the regulators are still lagging behind the speed of evolution of AIs, leaving a polarized public to take matters into their own hands, for the time being.

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