Machine Artistry

Khutso Nkadimeng | 08/12/2021

University of the Witwatersrand

Abstract

In the world of Artificial Intelligence (AI) and Art, one of the most critical questions is: "can computers be artists?" The bulk of this essay draws from an article titled Can Computers Create Art? by Computer Scientist and Researcher Aaron Hertzmann. Hertzmann anchors his arguments about art creation as a social act that only social agents can perform. Furthermore, he argues that without a marketing campaign convincing people and the art world to change the meaning of art, there are two scenarios under which a machine could be credited with artwork's authorship. First, if the computer has human-level consciousness and intelligence or, second, if it is a Social AI. I argue that human-level consciousness in a computer may be artistically useless to human beings, and perhaps more valuable to machines. I propose a possible creative machine without high levels of consciousness. In the presence of such a machine, I suggest a role I think human artists will play. Whether successful or not, I believe that building a creative computer will enhance human creativity and elevate our consciousness.

Introduction

Can computers be artists? Breakthroughs in artificial neural networks such as the Generative Adversarial Network. Breath-taking paintings by robots like e-David from the Universität Konstanz and CloudPainter by Pindar Van Arman, and other artefacts such as music produced by Artificial Intelligence (AI) agents have brought public interest to this question. Aaron Hertzmann, an Affiliate Professor at the University of Washington, IEEE Fellow and Principal Scientist at Adobe Research, has given a detailed answer to this machine artistry question in his 2018 essay titled Can Computers Create Art?

According to Hertzmann, "Art requires human intent, inspiration, a desire to express something" (Hertzmann 2018), and that alone disqualifies computers. There is a long list of other requirements one can think of as forming the foundation of an artist: environment, experiences, and growth. With the possibility of that list growing and alternating based on different perspectives, Hertzmann proposes a more concrete theory. He argues that "art is primarily a *social act*", "*an interaction between social agents*" (Hertzmann 2018) and can therefore only be made by social agents. He defines a social agent as: "anything that has a status akin to personhood; someone worthy of empathy and ethical consideration" (Hertzmann 2018).

In answering a similar question, can machines be artists, Arthur Still and Mark d'Inverno also make the social argument when they ask, "but what if what we mean by "art" and "artist" is not just the making of novel products that are regarded as creative, but the *way of life* that accompanies this making, including the long training and *socialisation*, and the sheer slog of preparation and effort that culminates in becoming an artist?" (Still and d'Inverno 2019: 2).

Arthur Still and Mark d'Inverno fell into the trap of listing attributes exhibited by human artists but lacked by computers, qualities such as effort, growth, and preparation. That is a practice Hertzmann caution us against when he asks; "How do we define any of these attributes precisely? How much is enough?" (Hertzmann 2018: 20) However, the two researchers' questions and *socialisation* argument echoes Hertzmann social theory.

The social argument is not particularly new. In 1950, Alan Turing had to address a similar objection when proposing The Imitation Game, what we now know as the Turing Test. A test designed as a game to assess machine intelligence. In what is called The Argument from Consciousness (Turing 1950), Turing quotes from Professor Jefferson who argues that a computer artist must not only write a sonnet or compose music. It must do so, compelled by its feelings and emotions and be conscious of what it had done. The machine must feel pleasure when it succeeds and miserable when it fails or does not get what it wants (Turing 1950).

With what I have presented to you so far, it is easy to answer the question I started with and give a resounding no. But your answer would be to a different question to what I am asking; you would be answering the question, "can machines be human". Based on the arguments I have presented from Arthur Still, Mark d'Inverno, Professor Jefferson and Aaron Hertzmann, it is increasingly clear to me that the word artist is perceived as being synonymous with human. For that reason, I will be answering the philosophical machine artistry question with a slight change by asking; can machines be creative?

I propose a new type of creative I call a Proxy Artist and address the questions of authorship and credit of computer-generated art. In addressing the questions of consciousness and the social nature of artists, I will argue that a machine of human-level consciousness is artistically useless and that consciousness, as it is commonly understood, is not necessary to solve the machine creativity problem. I am taking a different approach to Hertzmann. I propose that art does not necessarily have to be made by social agents; it must be made *for* social agents.

To expand on my position, I will first go through Machine Consciousness followed by Social AI. Both topics are in response to the two main qualifications Hertzmann identifies as necessary for computers to be artists. I then layout the arrangement of a creative machine as I envision it as well as the reasons for creating such a system. Before proposing the concept of a Proxy Artist and concluding, I outline what I believe to be the role of human artists in the age of AI-generated art.

Machine Consciousness

A machine capable of producing art, as defined by Aaron Hertzmann is characterised by two major traits: human level intelligence, and more importantly, human level consciousness. Before proposing a creative machine, I begin by addressing the problem of consciousness in relation to human artists and how important it is to artificial creativity.

Consciousness is the most compelling argument against AI artists (Turing 1960; du Sautoy 2019; Hertzmann 2018; Chella and Manzotti 2007). That is the case because we essentially have no clear consensus on what consciousness is despite centuries of studies continuing to this day, including more recently in the field of Computer Science and Artificial Intelligence

(Minsky 1991; Sanz, Lopez, and Hernandez 2007). If we do not agree on what consciousness is, then how can we code it into a machine? But we know or at least are convinced that consciousness is part of the formula for creativity and artistry. As Antonio Chella and Riccardo Manzotti have stated: "consciousness corresponds to many aspects of human cognition which are essential to our highest cognitive capabilities: autonomy, resilience, phenomenal experience, learning, attention". (Chella and Manzotti 2007) All these aspects are important to any artistic agent and therefore vital to a machine artist.

According to the renowned British Mathematician and author of The Creativity Code, Marcus du Sautoy, "Until a machine has become conscious, it cannot be more than a tool for extending human creativity" (du Sautoy 2019: 285). What the machine does is to create affordance. Human creatives look at it and wonder the possibilities. Asking themselves how the machine can be used for more creative outputs. In a way, this is a quality a computer creative must have, affordance, which is natural to conscious entities. When proposing the type of computer that can be credited with creating artwork, Aaron Hertzmann suggests, among other options, what he admits is a science fiction dream, an AI with human-level intelligence and consciousness (Hertzmann 2018: 20). I believe such an AI will be a monumental achievement for humanity but will not be useful to the arts in the current culture and our present understanding of art.

I believe that a creative machine must necessarily create art that can be created by human artists. That is, machine creatives must imitate human artists and create art *for* social agents, but more specifically, human beings. The reason for that is simple; any creation deviating from this necessity will not be regarded as art by human beings. Looking at conscious human behaviour, we can extrapolate that a conscious AI will not create art for humans. As art is social, it will do so for its fellow AI systems. Even if it did try to aim the work at us, we most likely would not understand it as art but as a mere form of language. Which will then take us back to the question, can machines create art? For this reason, I believe human-level consciousness is not necessary for machine artists, and it may be detrimental to the value of the art machines produce for people. An artistically valuable AI must create art for human beings.

Social AI

Aaron Hertzmann's theory is rooted in the social nature of art. He hypothesizes that "art is primarily a social behaviour" and that "any human can make art because humans are social creatures" (Hertzmann 2018: 16). Thus, short of a human-level consciousness and intelligence, Hertsmann theorises that another type of machine that could be credited with authorship of artwork is a Social AI.

A Social AI is not as "intelligent" as a "true AI", but it must have social opinions suggesting a feeling and some level of inner consciousness. It must be something we can have relationships with, and feel is "worthy of empathy and ethical consideration" (Hertzmann 2018: 18). Hertzmann also refers to this type of system as a "Shallow AI." Because once we reveal

precisely how the Shallow AI system works, it becomes clear that it does not have real intelligence (Hertzmann 2018: 21). That means once we understand the mechanisms and algorithms governing a Social AI, we will no longer consider it intelligent in a true sense of the word. We will be able to predict its outputs and therefore not appreciate its artistry.

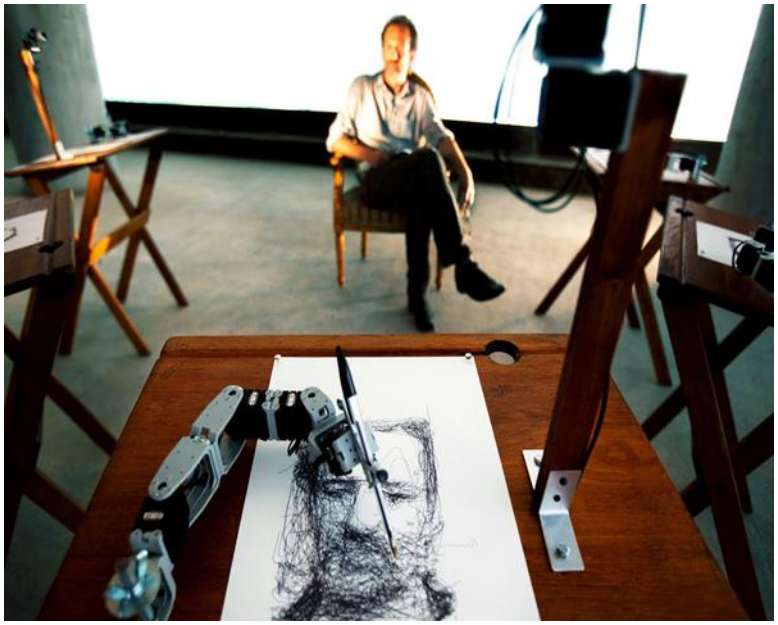

Figure 1: Paul the Robot sketching Patrick Tresset

Shallow AI as a concept seems to be in direct conflict with social interactions taking place between people and AI agents. I will use Paul the Robot, an art installation by Patrick Tresset to demonstrate just how simple it is for a non-social agent to stimulate social interactions. Paul is a simple robot that consists of a robotic arm, a camera, a computer program, a pen, and paper to sketch human portraits (Figure 1). There is nothing in the inner workings and algorithms of Paul the Robot to suggest any level of consciousness (Tresset and Fol Leymarie 2012).

The robot works by first taking a picture of the subject sitting in front of its camera and then sketching it on paper. But it keeps stopping to look at its subject and its drawing like a human artist would when sketching a portrait. However, that is completely performative, the robot does not take any more information after the first photo, it just pretends (Patrick Tresset introducing Paul the sketching Robot 3:00). Tresset gives this information to Paul's subjects. But even with that knowledge, subjects can be seen trying to maintain their posture throughout the process. They interact with the robot as they would with a human artist even when they are fully aware of how the machine works. Paul the Robot was designed *for* social agents and its interactions with people proves that there is an artistic value to machine created art.

A more famous example of a Social AI people interact with similar to Paul the Robot is ELIZA; a virtual psychiatrist developed by a team led by Joseph Weizenbaum. According to Marcus du Sautoy, "Interactions with ELIZA were so convincing that reportedly Weizenbaum's own secretary once asked Weizenbaum to leave the room so that she and ELIZA could have a private conversation." (du Sautoy 2019: 239) But a closer look at the construction of ELIZA reveals a long list of "IF-THEN" statements. If the client asks "X", then

respond “Y”. Even with the internet as the system’s database, it is easy to see why some scenarios will not be accounted for—and for this reason, Hertzmann classifies ELIZA as a shallow AI; the same as modern chatbots.

But there is a good reason why Hertzmann believes a Social AI could one day be credited for creating art. Let us for a second think about what Weizenbaum’s secretary said. Being the lead developer’s assistant, she must have known with certainty how ELIZA works. Yet, she requested to have a private conversation with ELIZA. It is reasonable to conclude that to the secretary; it did not matter that ELIZA was just IF-THEN statements put together, there was still satisfaction gained from the interaction. Therefore, if it did not matter to someone with intimate knowledge of the system, then it is likely that the general public would feel the same about the machine. It would not matter to people whether the system is human or not. This assumption brings us closer to answering the question, can computers create art? Because it is clear that people are willing to look past the silicon nature of machines. What matters is how the outputs of the silicon creative make people feel. The outputs meant *for* social agents.

The Creative Machine

If human-level consciousness in a machine will most likely not benefit the arts, how should an artistic computer be constructed, and why should it be built? I think it is important that I clarify that I am not against creating a conscious computer. On the contrary, I hope to see one in my lifetime. If I built artificial consciousness, I would go collect a Nobel Price before I am even nominated. But I do not believe the problem of consciousness should be solved before we can have an artificial creative that can be generally credited as an artist and given authorship status. I think that an abstract level of consciousness will be helpful for creative outputs in machine creatives. Thus, in this section, I will propose an approach to produce such a system. I will also highlight some success in computational creativity, which I believe to be proof that computers can be creative.

Why try to build a creative computer? Only human beings can be creative!

The objection to a creative machine is a combination of human exceptionalism, fear, and genuine philosophical and practical problems with such a system. Fear of technological advancement is nothing new. In the art world, the most famous example is photography. According to Hertzmann, “Many people believed that photography could not be art, because it was made by a mechanical device rather than by human creativity.” (Hertzmann 2018: 4) I find this account interesting because a camera was once credited with *making* photographs, but AI, with infinitely more complexity and much more autonomy is struggling to get such status. Instead, it is labelled a sophisticated tool (du Sautoy 2019: 285). The problem with photography was that it was going to replace many artists specialising in photorealism and portraiture. Naturally, they would resist. It threatened “real art”, they said (Hertzmann 2018: 4).

Artificial Intelligence faces the same type of fear. What good is a truck driver if the truck can drive itself? Alan Turing captured it well in The "Heads in the Sand" Objection: "The consequences of machines thinking would be too dreadful. Let us hope and believe that they cannot do so." (Turing 1950) Rather than dealing with the rapidly developing AI technology, people would rather stay in blissful ignorance or terrible fear that they will lose their livelihoods. For a while, people were pushing the idea that once AI takes over repetitive jobs like driving, being a cashier or factory worker, people will be able to focus on *making art* and enjoying life. The consequence of machines being creative is much more dreadful now, I imagine the human race thinking: it will even do the one thing we thought that only we could do.

Human exceptionalism, on the other hand, is perhaps as old as time. We like to believe that we are special and superior to all creations, especially our own creations. Just like the cult value that made art inaccessible to the masses throughout history (Benjamin 1936), the commitment we have to the idea that only human beings can be artists sounds almost religious. We believe in our unique and singular existence, that only we can make art. And that ability cannot be accessible or afforded to any other entity other than human beings. But the religious stance makes for an interesting counterargument.

It can be argued that everything in existence, including human beings, is a product of a thinking source. A Supreme Being when reasoning from Theology or the universe or nature for the non-religious. If we say machines are created by human beings, and therefore the machine's creative outputs must be attributed to the designers and makers of the system and not the computer itself. We can use the same logic and argue that all our creations as human beings must be credited to that thinking source behind our creation, leading us to the question of fate versus free will: are we as autonomous as we would like to believe, or the world is set with predetermined destinies for all of us? We could be in a pure Simulacrum (Hanley 2003). This is an entirely different conversation altogether but one with striking parallels to human beings versus AI agents.

While fears about job displacement and identity crises posed by artificial creatives are understandable, history suggests that the future looks brighter than people realise (Price 2008). Some of the most influential art movements in history, like Impressionism, were directly influenced by photography. When it became clear that artists could never compete with cameras on visual realism, art became abstract. (Hertzmann 2018: 5) New technology may make some jobs obsolete, but it also gives rise to many more jobs.

When 3D Computer Animation was invented at Pixar (Price 2008), it frightened traditional animators at Disney when it was introduced to them. Traditional animators feared that they were going to be replaced by computers (Paik 2007). In the end, what was replaced was the old animation techniques giving rise to a new and thriving animation industry. An industry we can all access through lessons from a platform such as YouTube and free open-source software such as Blender. Meaning a pool of talent from all over the world. That is the potential of a creative machine.

Artificial creativity will not replace the human intellect. It will enhance our ingenuity. The most important reason for building an artificial creative is to advance ourselves as human beings. Given how tough a challenge building such a system is, lessons from it will be applicable in many other fields like autonomous transportation, robotics and even teaching. To make a creative machine requires an intimate knowledge of creativity and its inner workings, meaning we could then start teaching it to people with greater ease. Developing such a system will help us understand our brains and ourselves way more than we do now. Ironically, it will also show just how creative we are as people.

If a machine is programmed to do something, how can it be creative?

Ada Lovelace, the first computer programmer in history, cautioned us about any ideas of a creative Analytical Engine (computer predecessor). She wrote in her memoir, "It is desirable to guard against the possibility of exaggerated ideas that might arise as to the powers of the Analytical Engine. The Analytical Machine has no pretensions whatever to *originate* anything. It can do whatever we *know how to order it* to perform" (du Sautoy 2019: 2).

Lovelace was for most of history, correct. Until recently computer programs were written using a top-down approach (du Sautoy 2019). A programmer would write every single line of code and understand exactly how it affects the rest of the program. This meant that, unless the was a bug in the code, the computer would never do anything the programmer does not expect or cannot explain. But things are changing. Engineers are taking a bottom-up approach to computer code (Kock and Tononi 2008). They write a relatively small code and give it the ability to learn and the capabilities to evolve and adapt. That is the type of system that can do what *we did not order it to perform*.

Before answering the question in the subtitle, we need a definition of creativity. There is no real consensus on what creativity is. That is one of the reasons why it is so difficult to put it in a machine. I prefer a definition from Beth Hennessey and Teresa Amabile, for it is broad enough and also measurable. They define creativity as "the development of a novel product, idea, or problem-solution that is of value to the individual and/or the larger social group" (Still and d'Inverno 2019). Similarly, Marcus du Sautoy measures creativity using three qualities as a metric; novelty, surprising and valuable, two of which appear in Beth Hennessey and Teresa Amabile's definition. The exact three words of novelty, surprising and valuable are common in various creativity definitions used by most researchers in Computational Creativity.

To find a machine exhibiting all the three qualities of creativity as defined, we have to go back to March 2016. A historic time for Artificial Intelligence. It was a game of Go between DeepMind's AI, AlphaGo, and 18-time Go world champion Lee Sedol. A duel was set to take place over five games with a landslide victory for Sedol predicted by fans, analysts, and Lee Sedol himself (du Sautoy 2019: 28). What made the events of March 2016 significant was the challenge for the machine. Go was said to be the one game a machine could never beat a human

at, for it required intuition and creativity. With a nineteen by nineteen grid board as the arena and the number of possible moves in the game exceeding the number of stars in the universe, Go is said to probably be the most complex game ever devised (AlphaGo-The Movie 3:08). The game cannot be solved using brute force methods such as calculating all possible moves on the board the playing the move with the highest probability of reward.

Game two of human versus machine produced a moment that will forever be in the records of history; move 37. With Lee Sedol out on a smoke break, AlphaGo did not wait. It instructed its human representative to play move 37. Everyone was stunned; one commentator remarked, "oh, totally unthinkable move" (AlphaGo-The Movie 49:48). Move 37 was so unorthodox that it had all Go players in shock. Fan Hui, the European Go champion's first reaction was that it's a bad move that a human player would never make (AlphaGo-The Movie 50:10). Lee Sedol returned from smoking, and he was thunderstruck when he saw what was on the board.

Sedol, like most people, thought that AlphaGo's gameplay was based on probability and that the machine would optimise every move it makes. AlphaGo *thought* that in over a century of people playing Go, there was one in ten thousand chance that a human being would play move 37 (AlphaGo-The Movie 51:06), and the machine played the move regardless. Why? Clearly, this was a suboptimal play. But over fifty moves later, move 37 proved to be ingenious when it became central to the machine's victory. "Surely AlphaGo is *creative*", said Lee Sedol. "This move was really *creative* and beautiful", he continued (AlphaGo-The Movie 52:36).

Move 37 was new; it was novel and was contrary to centuries of Go tradition. It was also surprising; a player usually takes one or two minutes thinking, and Sedol took over twelve valuable minutes in a timed game to figure out why the machine made that play. Move 37 was also extremely valuable because it gave people new insight into Go and themselves. It changed the meaning of ingenuity in the game, pushed players creativity to a higher level, and showed the advancement of AI technology. Contrary to Ada Lovelace's Objection (Turing 1950), the move proved that a machine could learn to do what it was not precisely programmed to do. Move 37 was novel, surprising and valuable, and therefore *creative*.

The type of consciousness necessary for machine artists

Human-level consciousness may not be necessary to solve the machine creativity problem, but a level of consciousness is required. But it is not in a way that we have come to understand consciousness. An Artificial Creative must know what it is creating and why it is creating that way. Because there is a reason why artists create artefacts A machine needs one too. It must have an internal perspective of the world. In a way, the problem of artificial creativity lies in how information is processed (Chella and Manzotti 2007) in the system as opposed to feelings, emotions, inspiration, and self-reflection (Kock and Tononi 2008). Things that we associate with consciousness. To solve the problem of consciousness in machine creativity, we have to take Newton's Law of Universal Gravitation and remove "universal" from it. Let me explain.

Newton's Law of Universal Gravitation is a scientific algorithm used to explain and calculate the movements of bodies in the universe. Essentially, it is used to measure the effects of gravity. But the Law of Universal Gravitation was proven to not work on other bodies in the universe like Mercury (Deaton 2019). Not so *universal*, after all. But the law is still used today in precision sensitive areas like Rocket Science because it works well on Earth. Newton's principle does not explain gravity; it only measures gravity's effects. That is the kind of artificial consciousness model we need for a creative computer. It does not have to be *universal* and explain the hard problems of the human race. It must only be good enough to exploit the cause and effect relationship between creativity and consciousness. We do not need to calculate the gravitational forces of Mercury. We just want to do Rocket Science on Earth. Something similar to the Integrated Information Theory of Consciousness. I will elaborate.

Neuroscientist Giulio Tononi first proposed the Integrated Information Theory of Consciousness in 2004, and the theory has been in development since. It may be difficult to define what consciousness is, but we mostly know what it is not. That is the approach Tononi and Christof Koch took when proposing a conscious machine. They researched the requirements for human beings to be conscious and discovered that we could be immobile, incapable of feeling, never self-reflecting, and suffer long-term memory loss but still be conscious. (Kock and Tononi 2008) Therefore, conscious machines will not need to have emotions, to self-reflect, to move around or have a large storage.

The validity of the Integrated Information Theory of Consciousness may be challenged by people working in various fields concerned with matters of the brain. But what I believe is important for a creative machine model is what Koch and Tononi propose as essential for any system's consciousness, "the amount of integrated information that an organism, or a machine, can generate". "To be conscious, then, you need to be a single integrated entity with a large repertoire of states." (Kock and Tononi 2008) The problem of machine consciousness is a problem of information processing (Minsky 1991).

Our creative computer must be able to see, understand and contextualise. For example, say our machine is looking at a picture of a human face. The computer must first see the picture as integrated, which means it cannot see the nose, mouth, or eyes independent of the head, or the left half of the face independent of the right. The background, the colours, it must all be integrated into one. The reason for that is inspired by nature because that is how human beings see the world. We do not see bits and pieces, we see the whole picture at once (Tononi 2008).

Any computer with integrated information processing features will not need thousands of images of training data to make sense of a simple scenario, contextualise it and make necessary connections to create art. A repertoire of states means when looking at the face; the machine must eliminate a lot of other information like other body parts, animals, and objects. It must know what it is not looking at. Finally, it should be able to tell that it must be a celebration based on the happy face, dark background, and firecrackers in the distance—Probably New Year's Eve.

With a system like what I have just described, it is not hard to imagine the types of possible creative outputs. It is not just taking a random image and then painting it in the style of Vincent van Gogh. The machine could still paint like van Gogh, but the background of an image captured at the Union Buildings could be replaced with a South African flag or a thousand other creative possibilities, based on the internal information of the machine. I do not believe that Aaron Hertzmann would regard a system like this as a Shallow AI. I believe an Artificial Creative with this type of algorithm will be credited with the authorship of artworks. It is a type of system capable of subjective experience and therefore capable of artistry.

The machine I propose will be capable of artistry and creativity without us having to deal with the so-called hard problem of consciousness. The part that deals with phenomenal experience. All we have to focus on is how the computer perceives and process the information from its surroundings. By so doing we would have successfully modelled the cause and effect relationship between consciousness and artistry. We would have successfully used Newton's Law of Universal Gravitation right here on Earth.

The Role of the Artist in the Age of AI

If a creative machine is possible or is ever created, what role does that leave human artists? I believe artists will have a far more important role in the presence of artificial creatives. A role to dig deeper into our inner beings and discover more of who we are. This section addresses the question of the coexistence between human artists and machine creatives.

In the same way that photography has inspired the Impressionists, Artificial Intelligence can kickstart revolutionary art movements. Possibilities and opportunities are endless. As just a tool, AI will provide affordance (Norman 1988). I have mentioned this term before, to explain it further, it is a concept Don Norman uses to explain how the design of everyday things encourages users to perform certain actions. Norman borrowed the term from James Gibson who explained it in his book, The Senses Considered as Perceptual Systems, to explain the options the environment offers to animals.

For a child looking for cookies atop a cupboard, a chair that is normally used for sitting offers affordance, the child thinks creatively about how to get the cookies and climb on the chair to increase his/her reach. If something as simple as a chair could afford so many creative uses to a child, there is no telling exactly how much will be afforded to creatives by Artificial Intelligence.

AI could help existing art forms thrive as computer animation did for the animation industry when it replaced traditional cel animation (Hertzmann 2018). AI tools could do what the discovery of linear perspective did for Renaissance art and architecture. What we can learn from history is that things will change for the better. Artists will transform for the better, and their role in society may be even more significant.

In The Work of Art in the Age of Mechanical Reproduction, Walter Benjamin celebrates the loss of "aura". The quality of art which gives it authenticity and unique existence in space and time (Benjamin 1936). Benjamin was well aware of the resistance of the cult value of art, the primary factor of aura. It went from being based on ritual to personality. During the Renaissance, artists began signing their work and, in the process, secured their position as the main element giving art its uniqueness. Who made the art far outweighs what is the art in determining the value of an artefact. The cult of Renaissance greats like Leonardo da Vinci and Michelangelo continues to this day.

Things are about to change radically. If mechanical reproduction allowed *anyone* to be an artist, computational creativity is taking that to greater heights; *anything* can be an artist, including non-human entities. But there is a problem, "The uniqueness of a work of art is inseparable from its being embedded in the fabric of tradition." (Benjamin 1936: 4). The art creation process is so entrenched in the human artist that it is seen as a violation of our humanity to make an art-making machine. The creative machine threatens art "aura" more than any technology in history. Perhaps our commentators feel about artificial creativity what the poet, Charles Baudelaire felt about photography when he said, "If photography (*or in our case, artificial creativity*) is allowed to supplement art in some of its functions, it will soon supplant or corrupt it altogether, thanks to the stupidity of the multitude which is its natural ally." (Hertzmann 2018: 4)

The uniqueness of art is quickly changing with the ability to make art forms like music on demand. That is, being able to enter criteria for the type of music you like and an artificial musician generates songs for you in seconds. The knowledge that a machine made the music may be uncomfortable to many people currently. But as Hertzmann points out, there is always a human behind the AI doing the coding and training. I believe that making an artificial musician good enough to make music people appreciate is not only making a machine creative, but it is also the elevation of human creativity.

Walter Benjamin argued that if authenticity no longer serves as the primary criterion for the creation of art, then the function of art changes. Mechanical reproduction changed the art function from ritual to politics (Benjamin 1936: 4). I believe that the function of art is about to now change to spiritual. Not spiritual in the sense of ritual or religion, but enlightenment. Art is about to not only tell us about our current state of affairs and who we are as people. But it will tell us about how we were created and why we were made that way. Philosophy is one area of art that has attempted to address these questions. However, making what Roger Malina refers to as the "creative other" (Malina 1990) requires us to answer questions of the makings of our brains in practice. That, for me, is the best way to learn.

The artist's role in the age of AI is to elevate our consciousness and enlighten us. To dig deeper into our spiritual nature in order to explain our practical realities. One way to do that is by building the Proxy Artist. This process will take an artist from being an author make them "the author of the author of the works" (Audry and Ippolito 2019). They will become the creator

of creators, and that, in my opinion, is a higher credit potential for the AI designer(s) Hertzmann is worried we may unethically deprive of authorship credit.

Proxy Artist

I have now laid out the reasons for the creation of a creative machine. As humanity, we want to better understand our brain's inner workings and push our creativity to greater heights. With the help of AlphaGo's move 37, we were able to see that machine creativity is already possible. I have also proposed a workable way to create a practical artistic machine using a model of consciousness and the role of human artists in the machine's presence. I have also noted in the introduction that the word artist seems to mean human to many people. All of that culminates into what I call a Proxy Artist.

According to the Merriam-Webster dictionary, a proxy is "power or authority that is given to allow a person to act for someone else." The term is also used in computing for proxy servers, defined by Merriam-Webster as "a computer system that facilitates the exchange of data between users on a network." I am going to use these definitions to articulate a machine artist that we do not have to anthropomorphise. A system that can have subjective experience but is intentionally designed to make art for people.

A proxy artist is an intermediary between our collective artistry and our art appreciation. It learns from the art we make and create the art we love. It operates on our behalf but given access to the information we do not have, it can make decisions independently. A Proxy Artist is a system with access to our collective creativity and consciousness through the cloud. It is equipped with an artistic code that merges the creative spark of AlphaGo and the integrated information model of consciousness.

We need a proxy artist for two reasons. First, it will differentiate the machine artist from the human artist. For example, the sentence "artist Khutso Nkadimeng and his proxy artist Ay Eye" distinguishes between a human and machine, but both are artists. Secondly, it will enable us to address the ethical problem correctly pointed out by Hertzmann. He said that "if you convince people that an AI is an artist, then they will also falsely attribute emotions, feelings, and ethical weight to that AI." In addition to that, "we deprive the AI's designer(s) of authorship credit." (Hertmann 2018: 22) A proxy artist is still an artist, but a different type of artist, and it will be up to people whether they want to attribute feelings and emotions to it, but they will know it is distinct. Issues of authorship credit will be addressed in the next section.

Conclusion

Aaron Hertzmann's theory of what makes art is solid; art is a form of communication between social agents. However hard it may be to capture conceptually; consciousness is essential for any entity to have some form of artistry. For any machine to ever be credited with creating art, Hertzmann proposes two possibilities: the system must have human-level consciousness or be a Social AI agent. The system must have something to say socially and deserving of our

empathy as people. But I believe a creative computer worthy of authorship credit is somewhere in the middle of the two solutions proposed by Hertzmann or just above the proposed Social AI.

I believe a machine with human-level intelligence will create art in a way that human beings will not perceive it as such, thereby rendering it valueless. It would be something like the sound of a bird, we may like the sound, but it will never be mistaken for a poem. For a machine to be satisfactorily artistic, its consciousness must, by design, be constrained. But even that is still a science fiction dream. I believe a working model of consciousness focusing on the causes and effects of our inner selves will be enough to make a creative machine.

I do not believe that a machine artist must have feelings and desires for social commentary. Art can be a result of cold calculations given a particular goal. And the objective of our non-human artists should be to make art social agents may appreciate and value. Creating a good enough artificial creative will make artists more connected with themselves and change the function of art from political to spiritual. It will elevate human consciousness, intelligence and creativity. Through such an endeavour, we will begin to understand our brain's inner workings, our humanity.

References

Images

Merge Festival, *6 Robots named Paul by Patrick Tresset,* image, Merge Festival. Accessed 2021/06/17 < http://mergefestival.co.uk/artists/6-robots-named-paul-by-patrick-tresset.html>

Videos

AlphaGo - The Movie, 2020. Documentary Film. Directed by G. Kohs. DeepMind Accessed 2021/11/03 https://youtu.be/WXuK6gekU1Y

Patrick Tresset introducing Paul the sketching Robot. Video. Patrick Tresset. Accessed 2021/12/07 https://www.youtube.com/watch?v=4u0D57kqA1A

Citations

Audry, S. Ippolito, J. 2019. Can Artificial Intelligence Make Art without Artists? Ask the Viewer. *MDPI.* Accessed 2021/11/03 https://www.mdpi.com/2076-0752/8/1/35

BENJAMIN, W. 1969 (1936). The Work of Art in the Age of Mechanical Reproduction. *Illuminations.* H. Arendt (ed.). New York, Schocken. 217–251

Chella, A and Manzotti, R. 2007. Artificial Intelligence and Consciousness. *AAAI.* Accessed 2021/12/06. < https://www.aaai.org/Library/Symposia/Fall/2007/fs07-01-001.php>

Deaton, J. 2019. NBC News. Einstein showed Newton was wrong about gravity. Now scientists are coming for Einstein. Accessed 2021/11/02. < https://www.nbcnews.com/mach/science/einstein-showed-newton-was-wrong-about-gravity-now-scientists-are-ncna1038671>

DU SAUTOY, M. 2019. *The Creativity Code, Art and Innovation in the Age of AI*. United States of America: The Belknap Press of Harvard University Press

Hanley, R. 2003. *Simulacra and simulation: Baudrillard and the Matrix*

Hertzmann, A. 2018. Can Computers Create Art? *MDPI.* Accessed 2021/10/28 < https://www.mdpi.com/2076-0752/7/2/18>

Koch, C and Tononi, G. 2008. IEEE Spectrum. Can machines be conscious? Accessed 2021/10/28. https://spectrum.ieee.org/can-machines-be-conscious#toggle-gdpr.

Malina, R. 1990. Digital Image: Digital Cinema: The Work of Art in the Age of Post-Mechanical Reproduction. *Leonardo. Supplemental Issue*. Vol. 3, Digital Image, Digital Cinema: SIGGRAPH '90 Art Show Catalog (1990): 33-38

Minsky, M. 1991. Conscious Machines. *"Machinery of Consciousness", Proceedings, National Research Council of Canada.* Accessed 2021/12/07 < http://www.aurellem.org/6.868/resources/conscious-machines.html>.

MINSKY, M. 2006. *The Emotion Machine: Commonsense Thinking, Artificial Intelligence, and the Future of the Human Mind*. New York, Simon & Schuster.

NORMAN, D 1988. *The Design of Everyday Things*. New York. Basic Books

PAIK, K. 2007. *To Infinity and Beyond! The Story of Pixar Animation Studios*. San Francisco: Chronicle Books

PRICE, D. A. 2008. *The Pixar Touch*. New York: Vintage.

Rzepka, R. Araki, K. 2007. Consciousness of Crowds – The Internet as Knowledge Source of Human Conscious Behavior and Machine Self-Understanding. *AAAI.* Accessed 2021/12/08 https://www.aaai.org/Library/Symposia/Fall/2007/fs07-01-023.php

Sanz, R., Lopez, I. and Hernandez, C. 2007. Self-awareness in Real-time Cognitive Control Architectures. *AAAI*. Accessed 2021/12/06 < https://www.aaai.org/Library/Symposia/Fall/2007/fs07-01-025.php>

Still, A. d'Inverno M. 2019. Can Machines Be Artists? A Deweyan Response in Theory and Practice. *MDPI.* Accessed 2021/10/28 < https://www.mdpi.com/2076-0752/8/1/36>

Turing A. 1951. Can Digital Computers Think? Accessed 2021/09/14< https://aperiodical.com/wp-content/uploads/2018/01/Turing-Can-Computers-Think.pdf>

Turing, A. 1950. Computing Machinery and Intelligence. *Mind* Vol. 59, No. (236), Oct: pp. 433-460. Accessed 2021/10/28 < https://www.jstor.org/stable/2251299?seq=1#metadata_info_tab_contents>

Tresset, P. A. and Fol Leymarie, F. 2012. Sketches by Paul the Robot *Computational Aesthetics in Graphics, Visualization, and Imaging*.

Tononi, G. 2008. IEEE Spectrum. A Bit of Theory: Consciousness as Integrated Information. Accessed 2021/10/28 https://spectrum.ieee.org/a-bit-of-theory-consciousness-as-integrated-information