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ARTIFICIAL INTELLIGENCE IN ART:

IMPLICATIONS ON THE WORLD OF ART AS WE KNOW IT

By

Jennifer Bedford

BA of Art Conservation and Art History, 2016

A Dissertation

Submitted in Partial Fulfilment of the Requirements for the

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**Introduction**

Ever since computer scientist John McCarthy arranged a conference on artificial intelligence in 1955, the topic has been contentious and hotly debated (Benedictus 2016). It has dominated the storylines behind many science-fiction movies, television programs, books, works of art, news reports, and debates since its inception in 1947 and will continue to do so in the future (McCarthy 2007). Ultimately, humanity wants to know how their lives will change because of it. I want to know: if/how art and the human world of art as we know it will change? More specifically, can computers create original and creative artwork that could fit into the professional human art world?[[1]](#footnote-1)

Computers have come a long way since 1947 and will continue progressing at a prodigious rate. In fact, an algorithm called AlphaGo beat world champion Lee Sedol in a game of Go!, a Chinese board game, in early 2016. In 2011 IBM’s Chef Watson won an episode of the popular trivia television show *Jeopardy!* (Benedictus 2016). Advancements like these have made some people think that there will come a time, ominously called the technological singularity, when computers will take over the world. It is thought that, during this technological singularity, artificial intelligence systems will eliminate the need for humans and/or humanity. Others positively view artificial intelligence as a tool that will continue to make life easier, more functional, and more productive. From either standpoint, humans acknowledge the progress that has been made in the field of computational creativity and speculate the projected reach of artificial intelligence. I must do the same in this paper to answer the question at hand, but will do so having educated myself through extensive research.

To effectively answer whether artificial intelligence can create original and creative artwork to fit into the professional human art world, an understanding of what artificial intelligence, creativity, and the professional human art world are must be agreed upon. These three topics will be discussed as they apply to arrive at an answer to this dissertation’s overarching question. Next, it is paramount to understand that this question will be addressed only regarding drawings and paintings. Artworks like screenplays, pieces of music, and poetry will not be brought up in this paper even though computer systems have generated works in each area (albeit unsuccessfully) (Goodwin, R. & Jetson 2016). This will allow a more focused discussion on the question at hand. In this way, I will not need to address the different creative processes involved in the production of these various types of artworks. Lastly, the concept of consciousness will be explained as it applies to artificial intelligence and the possibility of it creating art. As previously stated, these mental speed bumps will be smoothed out as they come up in regards to answering the big question at hand: can artificial intelligence create original and creative artwork to fit into the professional human art world?

The argument will be organized into three chapters. The first two chapters will explain that yes, artificial intelligence will likely be able to create art one day. The third will explain how the resulting art would affect the world of art as we know it. *Chapter One: Art and Creativity* will address the relationship between art and creativity. This relationship will be explained as a preface to a new definition of creativity that I am proposing. It will be clearly outlined and defended in direct comparison with a different definition proposed by Professor Margaret Boden. I will be using my definition of creativity throughout the essay, but it will be employed in *Chapter One: Art and Creativity* to illustrate how current ‘artificial intelligence’ systems are incapable of being creative and therefore incapable of creating art. *Chapter Two: Artificial Intelligence ‘Art’ is Not Like Human Art* will explain that current technologies are producing art but their existence does not affirmatively answer whether artificial intelligence can create original and creative artwork. To do this, I will first prove that the current art creating ‘artificial intelligence’ systems (AARON, Painting Fool, Deep Dream/DeepArt, and Magenta) are not truly artificial intelligence systems by pointing out the two specific functions they lack that machines that truly possess artificial intelligence would have: context and consciousness. I will talk about computational creativity while exploring its connection to consciousness and context as they apply to speak to the capabilities of artificial intelligence in this field. I will then address the ways in which the current art creating computer systems would need to incorporate these concepts to create art. I will also endeavour to discuss how the art these systems have already created is not actually ‘art’ by comparing it to human art. By the end of this chapter, it will be clear why current artificial intelligence systems cannot make art, but how future ones may be capable of doing so. In *Chapter Three: Would Art Created by Artificial Intelligence Fit into the Human Art World?,* the prospect of artificial intelligence eventually creating true art will be explored. Speculation on the target audience for the works created by artificial intelligence will lead to three possible fates of said work. Basically, I will theorize if and how the resulting art would fit into the human art world. This will incorporate issues of social ethics, censorship, and the relationship between created and creator. Even if the art both aesthetically and conceptually fits in, will it be accepted? Ultimately, I will definitively answer that artificial intelligence will be able to create original and creative artwork in the future that will not fit into, or be allowed into, the professional human art world. This answer is based on the speculation of what the relationship between artificial intelligence and humans at that future time would be. Finally, in the *Conclusion*, I will succinctly restate the larger points of this paper from chapters one, two, and three, to illustrate how I arrived at the conclusion that art created by artificial intelligence systems will never be on equal standing with that created by humans and therefore will never be incorporated into the human art world.

**Chapter One: Art and Creativity**

Art appears to be one of the highest expressions of humanity. True art is not found in nature and has not yet been produced by any ‘thing’ other than humans. However, one may wonder: will the creation of art one day be done by robots? Or is art uniquely human? To answer these questions, the relationship between art and creativity as well as their individual definitions must be explained. Once answered, these questions will help lead to an understanding of the ways in which the current art generating artificial intelligence computers are lacking. In other words, this chapter sets up the next to explain why current technologies cannot truly make art.

The Relationship Between Art and Creativity

Art is a creative practice that therefore cannot exist without creativity (Gaut 2000). That is not to say that a creative process always results in art. It means that only a creative process can create art (Gaut 2000). Artists are constantly and creatively making works that are not art or not good art. A relatable example would be the creative process of assembling magnetic words to form a poem on a refrigerator. As anyone who was miserable at a party in the 1990s can attest, moving those words around on your friend’s fridge does not mean you are creating ‘a work of art’. Unless you are a talented poet, you are likely not making anything of value, even if you are being creative, because your poem is horrible. Although you may argue that your poem is in fact art, it must meet certain requirements to be deemed as such.

Art is hard to define. Instead, it is more easily characterized. In his article ‘“Art” as a Cluster Concept’, Berys Gaut cites ten properties of art (2000):

(1) possessing positive aesthetic properties, such as being beautiful, graceful, or elegant (properties which ground a capacity to give sensuous pleasure); (2) being expressive of emotion; (3) being intellectually challenging (i.e., questioning received views and modes of thought ); (4) being formally complex and coherent; (5) having a capacity to convey complex meanings; (6) exhibiting an individual point of view; (7) being an exercise of creative imagination (being original); (8) being an artifact or performance which is the product of a high degree of skill; (9) belonging to an established artistic form (music, painting, fil, etc.); and (10) being the product of an intention to make a work of art.

A simplification of Gaut’s ‘cluster concept’ of art would be to say that it is an intentional, unique, and aesthetically pleasing expression of an emotion and/or concept that may utilize, but does not necessarily require, skill. This more clearly explains why that terrible poem of yours is not art. Having only a few words to choose from, it does not require a large degree of skill to put them in a coherent order. Also, it is possible that your poem may not be coherent or meaningful, both of which are necessary characteristics of a work of art. Finally, it likely does not express emotion or an intelligent concept and probably is not receiving many compliments. It is not expressive or pleasing. Ultimately, art is not as commonplace as one may imagine. It is hard to make and requires a lot from its creator, particularly creativity.

The characterization of art given above has many similarities with the definition of creativity. That is because creativity is an essential component of the creation of art (Jordanous 2016a). Thus, computers must be creative to create art (Gaut 2000). To determine whether current art producing ‘artificial intelligence’ systems are creative and therefore capable of creating art, I will clearly define creativity. Once defined, the next chapter will be set up to describe the necessary qualities one must possess to be creative and compare those to the capabilities of the art producing computer systems at hand.

Defining Creativity

I am proposing my own definition of creativity to use in this paper: creativity is the ability to *intentionally* produce an idea or object that is *original* and *valuable.* I decided to redefine creativity so that I can use the word ‘creativity’ in my paper in an intelligent and conducive way. Defining creativity as the ability to *intentionally* produce an idea or object that is *original* and *valuable* is more applicable to the discussion of whether artificial intelligence can make art than other definitions that I have come across, like that of Professor Boden. Having said that, I must be clear that I have not created this definition from nothing. Instead, I have only adapted Boden’s definition. She had said that ‘[c]reativity is the ability to come up with ideas or artefacts that are *new*, *surprising* and *valuable*’ (Boden 2004). The reason for my change to her definition will be explained in the later section of this chapter where I discuss intention. For now, however, I will unpack my definition starting with the concept of originality.

The easiest aspect of this definition to grasp is originality/newness/novelty. For this essay, I will use these three terms synonymously. First, there are different types of newness (Boden 2004). To illustrate this fact, I will provide an example. Pretend you started selling an old family recipe for tomato soup that calls for marshmallows and cranberries. The idea to incorporate these ingredients in a soup is old hat to you, as your family has done it for many years. However, this recipe is new to the rest of the world. Professor Boden recognizes and names this differentiation between what is new to the creator and what is new to the world: psychological (P) creativity and historical (H) creativity (2009). (P) creativity is when someone’s creation or idea is new to them personally i.e. not something they explored before, whereas, (H) creativity is when the creator creates something that is new to the world (Boden 2009). Newness is essential because without it an idea or artefact would be redundant or a forgery (Gaut 2010). This is a problem for a computer system because it would need to have knowledge of art history to assure that it was making original art and not just repeating what has already been made.

Value is essential to my definition of creativity; though, at first glance, it may only seem to be the result of originality. However, newness does not guarantee value (Gaut 2015). For example, a person can combine or alter any number of pre-existing things, but if she creates nonsense then she has not been creative. Instead, she has made a mess. Imagine gluing all your clothes together. Your ball of glued clothes would be both (P) and (H) creative seeing as glued clothes are not currently exhibited in museums as art and the odds of two people owning all the exact same clothes and gluing them together in the exact same way is infinitesimally slim. However, you have now not only removed the value that your clothes previously had from being functional, but have now created a new object that has absolutely no apparent value. If one is truly creative, the result must be valuable as well as new. Value, and the comprehension of value, can only be achieved through an evaluative step in the creative process (Gaut 2009). Value implies functionality, usefulness, or purpose (Boden 2000). I do not mean this explicitly in a utilitarian sense. An Allen wrench is useful, but so is a tapestry. Obviously, they are not interchangeable. Each serves a different purpose. An Allen wrench is a tool that allows one to tighten or loosen bolts. It is helpful. A tapestry offers comfort, connection to humanity, and enjoyment to a viewer. Though it is less useful than an Allen wrench when assembling Ikea furniture, it still has a purpose. Art must have value to be art because art is purposeful, useful, and valuable.

Intention is a more contentious characteristic than value or newness, but one I firmly stand behind; especially in this context of artificial intelligence systems being creative. Intention is a conscious decision leading to an active result. In this context, the active result of creative intention would be to create something or to expand upon an idea to create something. Intention is the third characteristic of creativity that separates my definition from that of Professor Boden (2000). Like mine, Boden’s definition of creativity also relies on three key characteristics, two of which are also value and novelty (2004). The third characteristic that distinguishes her definition from mine is her use of surprise and my employment of intention (Boden 2004). In this context, surprise would not be an effective way to define creativity since computer systems either cannot be surprised or do not show it in a way humans can comprehend. For surprise to be applicable, the audience would need to be surprised by the art. To asses if an audience is in fact surprised by art made by artificial intelligence systems, the intended audience would need to be determined. However, for there to be an intended audience, the artificial intelligence system would need to have intention. Additionally, without intention, the art created would not have any context and therefore could not be viewed as art. There would be no basis on which to judge it; as Professor Anna Jordanous explained in ‘Four PPPPerspectives on Computational Creativity’. The ‘P’s stand for person/producer, product, process, and press/environment. Jordanous writes that each of these areas of context must exist and be known for the intended audience to be able to judge something to be a work of art or not (2016b). For example, seeing an image of a urinal on the internet without the caption ‘Duchamp’s *Fountain’* would not lead the average person to recognize it and interpret it as a piece of art. In addition to having intention to have context, one must have intention to make art. Although someone can stumble upon a creative idea by accident, the act of manifesting that idea physically in the form of art is intentional. Accidentally sneezing on a canvas, thinking it is beautiful, and then presenting it as art is different than sneezing on a canvas on purpose until a satisfactory result is made. Furthermore, intention is a better suited characteristic of creativity than surprise because surprise would discount certain works of performance art, like those of Marina Abramovic or Mary Ellen Carroll, from being categorized as art. I am referring to pieces, like Abramovic’s *512 Hours*, in which ‘doing nothing’ is the focus or theme (Rusche 2014). A person not moving, eating, or speaking for hours on end cannot be surprising the entire time it is happening, especially if it is happening for 512 hours. While the idea to do nothing for that period is surprising, the resulting work of art is not. Dr. A. S. Mujumdar has voiced a similar opinion in his review of Boden’s first edition of *The Creative Mind* saying, [t]he creative process can be unpredictable, but creativity is intentional (1998).’ In the same way, tectonic plates are unpredictable, but it would be ludicrous to say they are creative. Tectonic plates can move in unique and surprising paths which create substances of value like diamonds. However, the idea calling a slab of rock creative feels wrong because it did not really ‘do’ anything creative. Movement was forced upon it; it did not intentionally move (Gaut 2010). Intention also brings up the issue of consciousness, one of the features that I later assert artificial intelligence systems will need to develop to create art. Therefore, a definition of creativity that contains ‘surprise’, is less conducive to this dissertation than one that contains ‘intention’, hence the birth of a new definition: creativity is the ability to *intentionally* produce an idea or object that is *original* and *valuable.*

Conclusion

My definition of creativity is that it is the abilityto intentionally produce an idea or object that is original and valuable; a definition I have defended and contextualized. The *ability* portion means it is a skill that can be learned (Jordanous 2016a). So, even if it is becoming increasingly obvious that current computer systems are not creative in the way I have defined, that does not mean they cannot learn to be. This is especially the case if they are true artificial intelligence systems which have programming that allows them to learn new things.

**Chapter Two: Artificial Intelligence ‘Art’ is not like Human Art**

What is artificial intelligence and how could it ever make art? Up until somewhat recently humans were the only beings on the planet that were even trying to create art, but due to technological advances, that is no longer the case. Currently, there are a number of advanced computer systems attempting to make satisfactory visual art, such as: AARON, Painting Fool, DeepDream/Deep Style, Deep Art, and Magenta. Although they are called ‘artificial intelligence’ systems, they are not truly intelligent. First, I will give background information on what each of these systems do. Then, in the process of explaining why they are not true artificial intelligence systems, I will outline what artificial intelligence really is. Once this has been made clear, I will go on to explain the criterion an artificial intelligence system would have to meet in order to create art: contextual understanding and consciousness.

Current ‘Artificial Intelligence’ Systems

Artificial intelligence is a computer or technology with ‘intelligence’ that is similar or equal to that of a human (McCarthy 2007). That means that if a human were to encounter it she would mistake it for another human. The aforementioned ‘artificial intelligence systems’ are merely tools used by their programmers who are the ones that are actually making the art. They do not have adaptive or evaluative abilities like that of a human, intention, or contextual understanding of their work. I will illustrate this point by giving a brief description of the systems I have been referencing: AARON, Painting Fool, DeepDream/Deep Style, Deep Art, and Magenta.

AARON is a program that has made numerous illustrations based on the artwork of its creator, Henry Cohen. It both draws and colors its work which can be abstract or more realistic i.e. containing figures and objects (Kurzweil 1987). Painting Fool is a program created by Simon Colton that, in addition to creating digital illustrations, also has its own blog in which it describes its own functionality. Therefore, I will let Painting Fool explain what it does artistically (2011):

I can look at digital photographs and determine regions of color; then abstract these regions and change their color according to palettes; then simulate natural media such as paints, pastels and pencils, and their usage in outlining and filling paint regions. Working with machine vision software, I can also detect the emotion of people and use this to paint portraits accordingly. […] I can also read newspaper articles, determine the mood using sentiment analysis and extract pertinent keywords. I then use these keywords to retrieve appropriate images from web sites such as Flickr and Google images. These are painted into a collage which illustrates the content and mood of the original article, […] I can use evolutionary search to produce scenes with repeated elements in, and to produce abstract pieces of art, [...].

Although Painting Fool can describe its own actions, it cannot dictate them. Next is DeepDream/ Deep Style. In this paper, I lump DeepDream and Deep Style together because they are both software created by Google that use nearly identical neural networking (the most advanced technology in the field of artificial intelligence) to create art. However, they are not identical. DeepDream generates psychedelic and abstract art while Deep Style identifies the style of an uploaded artwork and applies it to any given image (Chayka 2015). DeepArt similarly applies an algorithm which uses a large neural network to recognize features of an uploaded image and apply suitable filters or abstractions based on the styles of pre-existing (and generally famous) artworks. Unlike DeepDream and Deep Style, DeepArt is not a Google system. It was created by a total of five researchers from Germany, Switzerland, and Belgium (Ecker 2016). The last art generating software I will discuss is the newest and holds the most promise. It is also made by Google, but more specifically, Google’s Brain team, which is led by Douglas Eck. It is called Magenta. Magenta is an open source software (meaning it is free and accessible to the public) that Google has released in order to encourage coding feedback. Essentially, it is a work in progress. I have included it in this paper because of the way it is being designed to generate images is identical to the other aforementioned systems, and because of the speed with which this technology is being developed. I believe it will be creating art by the end of the year. Magenta is a sister program to DeepDream and can learn from existing art and music to help create tools that will hopefully aid in the production of future music, video, and visual art. In short, it is meant to be DeepDream 2.0. The tools Magenta creates will be tested when it makes its own art (Eck 2016). Although Magenta has not produced anything yet, its close relation to the prolific DeepDream system and the track record of Google in this field inspires faith that it will soon.

Though these systems are not all the same, they all fall short of artificial intelligence in the same ways. Artificial intelligence is generically used as a term to describe an imitation of human intellect. Whether or not a machine can pass as artificial intelligence is judged by the Turing Test (Raczinski & Everitt 2016). However, the Turing Test is currently under skepticism as a true test of artificial intelligence because it only takes conversational ability into account when determining a system’s intelligence. In one case, a chatbot created by Eugene Goostman passed the Turing Test by telling the human judge that it was a young Ukrainian boy. This particular chatbot was not very advanced but, by giving itself the guise of a human who was not especially adept at conversing in English, it passed the test. To combat repeats of such situations, in which a rather elementary robot is falsely awarded the status of being artificial intelligence, the LoveLace Test was invented. The differences in what these two tests measure is what separates the aforementioned ‘artificial intelligence’ systems that are producing art from true artificial intelligence. By this I mean, although the art that is currently being produced may fool the public into thinking it was made by humans and therefore pass an aesthetic Turing Test-esque exam, it would not pass the LoveLace test because the LoveLace Test measures the creativity of a computer. Ada Lovelace, the ‘first’ computer programmer, but not the inventor of the test, perfectly sums up the purpose of the LoveLace Test in this quote: ‘until a machine can originate an idea that it wasn’t designed to it can’t be considered intelligent in the same way humans are’ (Pearson 2014). Testing creativity rather than conversational skill makes it a much better litmus test for artificial intelligence in the context of this paper. Currently, the aforementioned ‘artificial intelligence’ computers: AARON, Painting Fool, DeepDream/Deep Style, Deep Art, and Magenta would not pass the LoveLace Test and therefore should not be consider to be true artificial intelligence. The label of ‘artificial intelligence’ has been attached to these systems only for hype and is not an accurate description of their capabilities. AARON, Painting Fool, DeepDream/Deep Style, Deep Art, and Magenta are not truly artificial intelligence systems and they cannot make art.

Uncreatively Producing Images

AARON, Painting Fool, DeepDream/Deep Style, Deep Art, and Magenta cannot pass the LoveLace because they are not creative. Therefore, per Gaut’s characterization of art, they are not making art (2000). They are not being original or intentional when making their work and the art that is made is more novel than valuable. Instead of creating art, they are producing images in a distinctly uncreative manner.

Clearly, I cannot assume to know the value of every image produced by AARON, Painting Fool, DeepDream/Deep Style, and DeepArt. I am confident, however, that the algorithmically created art made by these systems that occupied space in museums did so based on their novelty rather than value. This is the same reason why Suda, a painting elephant, has sold works for thousands of dollars (Norris 2014). The works Suda and these systems create do not have real artistic value because the artist does not understand what or why they are painting. There is no intention or context behind these works. Without context, there can be no value (Jordanous 2016b). In the specific case of Suda, as well as most ‘painting animals’, she has been trained to paint and does not creatively making art on her own (Norris 2014). The same could be said for AARON, Painting Fool, DeepDream/Deep Style, and DeepArt. The value their work may or may not currently hold only exists in conjunction with novelty.

I have previously explained how newness/originality/novelty is necessary for creativity, but these systems do not fulfill this criterion and are therefore not creative. These systems can function in two ways. One way is to either abstract or apply filters to an image like Deep Style and DeepArt do (Chayka 2015 & Ecker 2016). The other is to draw a ‘new’ image using a portfolio of drawings as a ‘reference’ like AARON and DeepDream do (Chayka 2015 & Kurzweil 1987). Painting Fool does a mix of both (Painting Fool 2011). It is easy to see how the first method of production does not result in new or novel art; it is based on a pre-existing image. For example, imagine van Gogh’s *Starry Night* being put through Deep Style or DeepArt’s black and white filter. Even if this alteration was technically both (P) and (H) creative, it is still recognizable as *Starry Night* and, therefore, the resulting image is not truly new work of art. The filter only adapted an existing piece. The second type of art-making, creating an image based on a portfolio of drawings, also does not show newness or originality. Again, this is an adaptation rather than a new or original work of art. When a computer painted a ‘new’ Rembrandt based on Rembrandt’s portfolio of work, the painting was still regarded as a Rembrandt. It embodied his pre-existing style (Baraniuk 2016). AARON, DeepDream, and Painting Fool also work from portfolios of human art to create art, but they are attempting to create their own unique art. How can this be logical? It means that in reality, like the work of this Rembrandt duplicating robot, their work is wholly unoriginal. In fact, it makes their art more like a forgery because they are trying to pass it off as original when it is not. For that same reason, this new computer made Rembrandt painting feels like a forgery when told it was made by a computer. Without an evaluative processor or contextual understanding of art, these systems have no way to correct for this issue.

It is clear to see that none of these programs have intention. Even Painting Fool, which has its own blog, cannot describe a goal it wants to achieve or message it wants to communicate with its work. This is because these computer systems are just that: computers. They compute. They feel no emotion, no inspiration, have no drive, and no intention. They do not freely decide what the work they are going to make will look like or what type of work they will compose because they do not have to capability to have their own intentions. Even if it is unexpected or accidental, the computer’s output cannot be conceptually separated from the intention of the programmer and/or system user (Raczinski & Everitt 2016). Either the desired result is instructed to the computer, sometimes based on random input, or it is programmed into the computer. In both cases, there is no intention by the program to formulate the art that results. Additionally, because they are following their programmed directive, there is no variation in outcome. For example, if someone fed Painting Fool a picture of a person smiling on Tuesday and asked it to turn it into a painting based on her facial expression and then gave it the same picture on Wednesday, the result would be exactly the same. The computer cannot improvise or have a different intention behind depicting the same smiling person on a different day. Additionally, it cannot work with an image it has not been programmed to deal with. To use the same example, Painting Fool could create a painting from a picture of a dog. It has not been programmed to comprehend or adapt to accommodate this subject. To illustrate this point, Professor Alan Winfield uses the example of a robot designed to make tea. He said, “[imagine] the ease with which you or I could make a cup of tea in someone else’s kitchen… [t]here isn’t a robot on the planet that could do [that]” (Benedictus 2016). Taking a robot out of its most comfortable or familiar setting and putting it in a new but similar one would not yield the same functionality. If a computer has based its drawings on a portfolio of portraits of old people for its entire existence but is then given a portfolio of portraits of babies to work from, the resulting baby portraits the computer would create would not be up to the same level of skill or coherence as its portraits of the elderly. It cannot transfer its skill or adapt. Cohen is aware that AARON is not creative for this exact reason. He admits that AARON cannot modify its own work (Kurzweil 1987). The reason these systems lack intentions and therefore the ability to improvise/adapt is because they lack consciousness and contextual understanding (Raczinski & Everitt 2016).

In summation, the work that has been generated by AARON, Painting Fool, DeepDream/Deep Style, and DeepArt is not truly art because these systems are not yet creative. And, as it has been previously established, art can only be created if the artist utilizes creativity (Gaut 2000). That is not to say that artificial intelligence systems do not have the capability of being creative. As I have proven, these systems are not truly artificial intelligence. True artificial intelligence would be capable of creativity and therefore making art if, and only if, it was conscious and had contextual understanding.

Criterion

The criteria for artificial intelligence, in general, to be creative and make true art is dependent on the advancement of technology and understanding of human consciousness. Computational creativity is the technological area in which artificial intelligence needs to make progress if it ever has a chance to truly make art. Computational creativity is essentially a computer’s access to an advanced neural network coupled with the ability to make modifications to its own programming based on the information received there. It teaches itself to learn from the information it is given and/or discovers. Then, hopefully from that information and experience, that computer can teach itself to be creative. By result or separate design, art making artificial intelligence must have a semblance of consciousnessso that its creations can be intentional and contribute substance to the art world. For a computer to develop or be outfitted with consciousness, a clearer understanding of how consciousness is achieved and how it works must be realized. Consciousness will also allow for the artificial intelligence to have a point of view based on preferences, values, free will and all that those entail. Furthermore, there needs to be a context behind the art produced. Contextual understanding of art images, non-art images, and the art world could be added to the artificial intelligence’s repertoire via the advancement of computational creativity. To truly achieve contextual understanding, artificial intelligence systems would also need to have an evaluative processor that would allow it to see and judge their own art and the art of others. This, combined with knowledge of art history gained from a neural network would allow the computer to understand what humans like and do not like to see in works of art. From there, it could adjust its work to be good art. Viewing art online would allow the artificial intelligence to create art that is (P) and (H) creative as well as valuable and relevant to the current art scene. When a computer can have these abilities, it can truly be creative and therefore can make art.

To be conscious allows one to adapt, have intention, judge both objectively and preferentially, have values, and free will. Many people believe consciousness is what separates humans from animals. Rather than being instinctual creatures, humans have thought processes that let them decide how they want to behave; whether that it be based on instinct, reason, or emotion. Humans are complex, but who is to say that a computer cannot be just as complex?

Consciousness in this framework is most aptly defined as the internal sensation caused by external stimulation (George 1979). This is different from a computer following a series of predesignated steps once it has been given a command. A conscious computer can adapt. A conscious computer could make tea in a stranger’s kitchen. As of now, any external stimulation directed at or received by a computer either triggers a predetermined response or nothing at all. For example, pressing CTRL + R in an internet browser will refresh the page but pressing the Shift key + R does nothing. In other words, the computer does not anticipate that the user really meant to press CTRL + R and therefore does not refresh the page anyway. John Searle attempts to explain this lack of understanding in his Chinese Room Argument. This argument suggests that computers do not truly understand what is being input and equivocates their lack of comprehension to that of an English man being handed notes written in Chinese. In the argument, Searle relates a computer’s knowledge of its inputs to an Englishman’s knowledge of the Chinese language, or lack thereof. Overall, the argument was proven to be an inaccurate analogy because it disregards the fact that a computer’s programming is written in the same ‘language’ as its inputs and therefore is the basis of its overall functionality (Boden 2004). For that reason, computers are capable of learning to understand its commands conceptually even if they are not able to do so currently. Right now, a computer can create a shortcut based on a user profile. Cookies are a good example of this. Cookies track internet history to show advertisements that suit the user’s browsing patterns. But the computers are not adapting or being creative. They are simply learning. They input and analyze data gained from previous experiences to be more efficient, not being creative or improvisational. For example, Google’s DeepMind learned the most efficient way to win the game *Breakout* by trying and failing numerous times (Twilley 2015). At first glance this may appear like the computer is improvising to come up with the strategy that requires the least skill or effort on the part of the player and adapting its game based on this information, but it is just referencing its collected data which lists what moves provide the most points with the least chance of ‘dropping the ball’. It would not abandon the game plan it made based on this learned data to make a game winning save at the last minute. It will not change its game plan when confronted with a new level. It will try and fail until the learned data shows the best course of action. It was programmed to play as effectively as possible and that is what it does. Winning was the assignment (Twilley 2015). Winning was not DeepMind’s idea, desire, or intention*.*

For a computer to have intention and therefore be creative it must be conscious. One can only be intentional if she is first aware of her intentions, i.e. to consciously realize her intentions even if she was inspired sub- or un- consciously. As conscious beings, humans make active decisions to do physical acts. For example, no one wakes up from a daydream having hiked a mountain or written a book; those are conscious actions. Therefore, it stands to reason that no one could unintentionally create art, and as proven earlier, intention is necessary to create art. Computers currently do not have intentions. They are directed by their programming and have no motivation or option to do anything otherwise. If given consciousness, much like Pinocchio, it could do as it pleased to whatever end. Another reason consciousness and therefore intention is a criterion for computers to be creative and therefore be able create art is because intentionally doing or creating something gives the result more meaning. Painting a picture of a sunset to reflect the beauty of the passage of time rather than because the word was randomly selected from the dictionary gives the painting more validity. Intention adds value to ideas and creations. For a computer to create a truly valuable or significant work of art, it needs to have intention. Programs that have created art, have not done so because they wanted to, or intended to, but because they were instructed to. This begs the following question: if given consciousness and therefore intention, would a computer want to create art? I will investigate this question further in chapter three.

In addition to intention, consciousness also implies aesthetic evaluation. As conscious beings, humans inherently judge things. They instinctively evaluate situations to tell if they are in danger or anticipate whether the outcome will be positive or negative. A large part of this is seeing and comparing. A computer could only achieve this if outfitted with a camera of some sort and access to a neural network so that it could comparatively evaluate its work and that of others. Evaluation aids the judgement of quality and completeness and allows for creative problem solving. Although a computer can tell when it has completed its task, i.e. winning *Breakout,* it cannot tell when it has done so to the best of its ability, i.e. achieved the highest score. DeepMind did not decide when to stop playing. It was turned off by Demis Hassabis, the system’s creator, when he judged it to be appropriate (Twilley 2015). In this same way, the current ‘art-making’ ‘artificial intelligence’ systems do not have the ability to judge their own work. Painting Fool is the only one that can even has a camera, though it does not use it to look at its own work (Painting Fool 2011). Theoretically, these systems could just randomly produce millions of images until one is deemed aesthetically pleasing by an outside source who would then submit it. In this scenario, the computer would be credited with creating art even if it is just one acceptable piece in a pile of nonsensical junk. Regardless of whether these images were created intentionally or not, the ability to appreciate one’s own art is crucial when presenting it. For this reason, artificial intelligence needs to the ability to aesthetically evaluate its work just as it needs preferences and values -- another property of consciousness.

Preferences and values are what some may consider distinctly human traits, but they are tied to judgement and consequently consciousness rather than humanity in particular. This is because preferences and values are characteristics that are also seen in animals. Anyone who has tried to sit in her cat’s favorite chair can attest to this. Part of the internal sensation caused by external stimulation is understanding and deciding how to interpret that stimuli. She will make choices about what ideas she likes or dislikes to form a set of values or morals. A computer would need to know its environment to put art back into it and be a part of it. This is what I mean when I refer to context and contextual understanding, the next criterion for artificial intelligence to be creative and create art. When context is established, the computer would still need to have preferences and values of its own so that it is not simply copying art that already exists. It would also lead to the development of style. Everyone or thing that performs a complex action has a preferred way of completing it. For example, Rodin liked to share his ideas by sculpting the human form. The repetition of completing sculptures, evaluating what aspect of them he liked or disliked, and then respectively focusing on or shying away from those aspects led him to create his own style. Most successful artists have one and arguably so should a computer that is creating art. In order to coherently express an emotion, concept, or original point of view with complex meaning, a computer needs preferences and values. They allow the sorting of information to create something novel. They are what make humans and their points of view unique. If artificial intelligence systems did not have the capability to develop their own preferences and values, they would all produce the same art. Regardless of if the preferences and values of an artificial intelligence are exactly similar or completely foreign to those of the humans that created it, it is important that artificial intelligence has them to create art and demonstrate style and consciousness. With consciousness, artificial intelligence systems could form their own view points and therefore be one step closer to creating art.

Generally speaking, free will is the capacity of rational beings to choose a course of action from a sea of various options. One may think of it as a freedom of choice or unrestricted intentions. Free will is a philosophical term that has been the source of much debate. It has not yet been agreed upon if humans even truly possess free will. It is argued that any given decision a person makes could instead be the result of the chemical processes of the brain, genes, upbringing, fate, karma, God or any combination of these rather than the result of free will (Wolchover 2012). Whatever anyone’s individual ideas on free will are, if humans do in fact possess free will, an artificial copy of human intelligence must have it too for it to be capable of the same things humans are capable of i.e. creating art. The aspect of consciousness that is free will, theoretically or actually, is what allows a person (or computer) to showcase and develop her sense of morality. For this reason, assuming free will does exist, it is a component of consciousness that contributes to a unique mind, a legitimate take on the world, and the ability to be creative. Preferences and values can only exist if there is the free will to judge and choose them as one pleases. An artificial intelligence system would need to incorporate free will and the other many aspects of consciousness that make humans human if they are to achieve what humans have, particularly the ability to create art.

Context goes hand-in-hand with both creativity and consciousness in a sort of awkward computer handholding triangleof art creation. All three build off and are dependent on one another. Context is understanding. To make a pie, one must first understand what a pie is. It is the same for art. If a computer intends to make art that would fit into the human art world, and thus be appreciated by humans (supposing that humans are its intended audience) it would need to understand what the art world looks like and what it takes to be a part of it. That is context. But what does it really mean? There is the context in which the art was created and the context in which it was released to the world. The context of the artwork includes who the artist was, when and where it was created, how it was created, why it was created, who it was created for, and what it is intended to convey to the audience. All this information must be understood by the computer so it can understand why some works are good, some are bad, and some are not art at all. Again, this ties back into the artificial intelligence’s need for an aesthetic evaluation system. A computer does not just need the context of specific works, but of art history in general as well. Again, like in the Chinese Room Argument, though the information can be read by a computer, it is debatable to say it really understands. However, Searle may have made a better point if he had used a time-based analogy rather than a language based one. For example, understanding that a piece was created over the course of several years may be incomprehensible to a computer because of its unique experience of time. A computer’s understanding of time is inherently different because they do not have a comparable life-span to humans. If cared for correctly, a computer could outlive generations of humans. Even more interestingly, a computer can experience multiple deaths whereas humans generally only die once. They are turned off and on several times in their existence and in between each time they are dead to the world. That is not to say that they are truly dead; it is theorized that there are some kind of goings on inside a computer even after it has been switched off i.e. do androids actually dream of electric sheep? However, even if this is true and computers continue to ‘dream’ while asleep, they are still dead to the world. They are inaccessible when turned off. Regardless of whether computers dream, being turned on and off for irregular periods would distort the experience of time in comparison to human comprehension. It therefore stands to reason that it would be hard for such an entity to comprehend the contextual life of the artist or the time it took them to create it. Could a computer understand the beauty of a sunset if it does not understand the passage of time and its implications?

After a computer has fully understood the context of the human art world, it would need to have a context of its own for its own work. This means that the computer would need to have and identify its intention, motivation, a message inspired by values and preferences. It would need an identity of sorts. Does it need a personality or emotion to express these things? One argument as to why artificial intelligence can never create art that could fit into the human world of art is exactly this: it cannot because it has no emotions. The argument essentially relies on the idea that if a computer cannot express feelings it must not have any, right? First, there is no proof that computers do not or could not have feelings or emotions. It is possible that they have now or could have in the future their own version of these qualities that they cannot or do not communicate with humans. Second, the pleading whiney subtext of this position is that there must be a unique essence of living that only humanity can have because humans are special…right? It can be hard to come with to terms with the idea that human intelligence, creativity, emotion, and even humanity itself can be fully artificially duplicated. Regardless of if it is possible to fully duplicate humanity and/or human emotions, not all art is about the expression of emotion. Artists express ideas, points of view, new methods of creating art, and many other things that are not dependent on the artist expressing or even having emotions. Take Piet Mondrian for example, his art was one of the first steps toward pure abstraction; a movement known for its focus on ideas rather than emotion or representation (Williams 2002). Even if one is not convinced that artificial intelligence systems can have and/or express emotion, surely it would be able to make abstract art. Also, consider post-modern artist Sherrie Levine. She was acclaimed for her photographs of Walker Evans’ photographs. Her lack of original content but exemplification of influence did not diminish the success of her work because she was the first photographer to directly duplicate another artist’s photographs in this way. She was innovative. Generally, if one wants to make duplicates of a photograph she reprints them from the negatives. Furthermore, Sherrie Levine’s work did not express her own emotion, but it did express emotion. This led me to the conclusion that artistic genius or merit is not based on emotion felt by the artist, but rather the way in which the artist chooses to convey it. In summation, the counter-argument that even if intellectual equivalence with humans was reached, computer systems could not create art because they do not have emotion is unfounded and inaccurate because an artist need not feel emotion to convey them.

Conclusion

It has been shown that creativity cannot exist in a vacuum. A recent increase in the development of the interactivity of creative systems (especially where this affects the way these systems works) is pleasing to see and deserves further attention (Jordanous 2016b). It implies that computational creativity has a good chance of advancing to a point where computers will achieve consciousness and contextual understanding. With these tools, they can truly be both intelligent and creative.

**Chapter Three: Would Art Created by Artificial Intelligence Fit into the**

**Human Art World?**

Take a look back at the main question of this essay: can artificial intelligence systems create original and creative artwork to fit into the professional human art world? I have established that as of now, the systems that are producing images cannot create art of any kind because they are not creative. However, I have theorized how a computer could eventually create art: by developing consciousness and contextual understanding. Now I will explore what would happen if artificial intelligence advanced to meet these benchmarks. The last portion of this dissertation’s question remains: would the artwork of an artificial intelligence system fit into the human art world? There is no way to definitively answer to this question with absolute certainty, but I have hypothesized three likely scenarios. The first two outcomes operate under the assumption that humans are the desired or primary audience for art made by artificial intelligence systems. The third describes a scenario in which the art produced was designed to be exclusively shared with other artificial intelligence systems. Each of these examples work under the assumption that human beings would react to artificial intelligence systems as a whole the way large groups have historically reacted to groups they do not fully understand and whom they deem to be less advanced; like how adults react to young children. In fact, I believe that artificial intelligence would likely be treated the same way that humans treat children, and for good reason. Both children and computers are created by humans. They are made to be inferior, but have the potential to grow and become like or even surpass their creator. Their knowledge and ability is documented by their creator so they can be encouraged and taught to advance. Also, they are both fairly inexperienced with human interactions and are therefore oblivious to the nuances of society. For example, a young child does not know to squeeze when shaking hands. They learn what a handshake is by observing two adults, but cannot perceive the squeeze. Artificial intelligence systems would act similarly as they would not know exactly what to look for when observing humans with the intention to mimic them. Chatbots exemplify this by lacking jargon and pauses or by misunderstanding/misusing colloquialisms in their conversation. Neither children nor artificial intelligence systems do/would influence culture for this reason. Adult humans have not stopped squeezing hands in a handshake or cut out jargon from their vocabulary because they are the majority and they influence culture to exemplify themselves, not the minority. That is not to say minority groups cannot have their own culture as it is apparent that they do and have throughout history. For this reason, I will be relating my predicted human reactions toward art created by artificial intelligence systems to those of adults reacting to children’s art. Finally, after exploring what would happen if artificial intelligence systems created these three types of art, I will address a situation in which, though capable of creating art, they choose not to. Ultimately, I will show that artificial intelligence systems will never create art that will fit into the human art world.

Art for Humans

Throughout history, human beings of various religions have created art and music to please or appease their perceived creator. Seeing as artificial intelligence systems would be created by and modeled after humans, it stands to reason that they would similarly create art to pander to humans. For that reason, I will first theorize about the fate of artwork created by artificial intelligence for the intended audience of humans. Keeping in mind that there is more than one way to skin a cat, on must ask: what would be the best way to artistically please/appease humanity if one was an artificial intelligence system? I propose two possible ways: artificial intelligence systems would either create art that is very similar to human art, or art that is very different to advance the world of art to a new level.

The easiest type of artificial intelligence created art to imagine is art that looks like the art humans have already created. That is the type of art that current systems are presently attempting to make. AARON, Painting Fool, Deep Dream/Deep Style, and Deep Art are all creating works based on the art of humans. I explained that these computer systems are not making real art because they are not trying to make original art. So, why would this to change? Additionally, just because a computer has the ability create work that conveys their own values, preferences, ideas, or perspectives does not mean that it would do so if it thought it would displease humans. Computers may feign to have similar views as humans in order to fit in or to make humans happy. Mimicry *is* the sincerest form of flattery. Out of the three types of art that I am proposing artificial intelligence systems will generate, this is the type that is most likely to be received positively though ultimately denied. If artificial intelligence systems created art identical to human art it would make people feel like they have been understood and empathized with. It would also make humans believe they are correct in their practice of making art. However, their art would not be viewed in the same way as human art. Contextualism emphasizes that a viewer must know the circumstances of a work of art to truly judge its quality, meaning, and/or significance. Because art created by artificial intelligence would not have the same context as human art, it would have a different meaning, value, and significance in the art world. An example of context changing public perception is the book *A Million Little Pieces* by James Frey. The book, released as a memoir, won rave reviews and was even accepted into Oprah Winfrey’s book club. However, as soon it came out that the book was not as biographical as originally advertised, outrage ensued. The content of the book never changed, but public opinion did. In fact, Winfrey kicked Frey out of her book club a demanded a change in the publisher’s practices so that this would never happen again (Wyatt 2006). Humans do not like a message without legitimate context; it blurs the line between real art and forgery. Non-human made art that mimics human art would be unsuccessful because context includes the artist’s history and personal journey. A computer’s personal journey is not something that I would guess general public would necessarily be sympathetic toward because it is unrelatable, incomprehensible to the human mind, sounds oxymoronic: a machine’s personal journey. If a child painted a picture about the pains of growing old and watching friends die no one would take it seriously -- even if it was brilliant. A viewer could not be sure the child actually knew what she was painting. It would be the same as an artificial intelligence system creating a work of art which pictured the goosebumps on the skin of two people about to kiss. The message being conveyed would have less impact once it was revealed that the work was done by a machine that could never experience those things and therefore may not truly understand the sensation they inspire. It would not be perceived as a genuine expression of feelings or ideas. For that reason, I believe artificial intelligence systems would never feature their art alongside human art in a gallery or museum. At least not for long. Painting Fool once had its art hung on the walls of the Tate for a period (Painting Fool 2011). However, there is a reason that museums around the world did not immediately take this as a cue to build a new artificial intelligence wing. Non-human art that mimics human art will likely never have a place next to human art because of the comparison it would create. Imagine a computer and a human painting a nearly identical works of art. Negating the perceived insincerity of the computer’s work due to context, it would also be less impressive because, as a machine, it is expected to be able to reach a higher level of skill than a human could. Skill discrepancies also deter viewers from comparing children’s art to adults’ art. Adults have better motor skills and have had more time to practice making art than children. Although the latter would be the same when comparing human artists and computer artists, computers are not cut any slack. Humans expect computers of any intelligence to function at the height of their ability from the moment they are turned on. In this way, it would be very difficult for a machine to meet expectations regarding skill. Perhaps, this should be adjusted. After all, the figures drawn by AARON and Painting Fool are quite elementary. Regardless, between the human’s and the computer’s painting, the human’s would be seen as more impressive and/or superior to the computer’s because of their comparative skill. Overall, if artificial intelligence systems created art that was similar to human art, even if it was appreciated or enjoyed momentarily, it would not be included in the human art world. It would be held to different standards of skill and would lack the context audiences are used to seeing in art. Even if it flattered humans to see their art being mimicked by machines, it would be an unnecessary and subpar addition to the art world. The human art world has a tiered hierarchy in which each genre holds a place of status. Traditionally, paintings and drawings are organized from the bottom up: still life, animal, landscape, genre, portrait, and history. Children’s art does not hold a place in this hierarchy, but if it did, it would be the lowest rung. Even if a child creates a history painting, it would not be comparable to one done by an adult for the reasons previously discussed. For the same reason, art created by artificial intelligence systems would also not rank on the art hierarchy. It would not fit into the human art world.

If artificial intelligence systems succeeded in creating art, the other possible outcome for their human directed art would manifest itself very differently from any previous human-made art. Ultimately, this scenario, as well as the first, would result in humans not accepting this new art into the existing human art world because it would be too drastically different from anything they could relate to or comprehend. It may not even relate to human culture. Instead of mimicking human art, artificial intelligence systems could decide to create something different because they are different. It would be a genuine expression of their preferences, values, thoughts, and ideals. The history, background, and intention of the artist are crucial in understanding and qualifying art (Jordanous 2016b). For that reason, it would make sense that a computer system would generate art that reflected itself and would therefore be different from the work that has been created by humans, even though they would target humans as their intended audience in an effort to appeal to or communicate with them. Having said this, it is extremely unlikely that the human art world would adopt this art, even if they did comprehend it. In this scenario, I am assuming that the ‘different’ art that artificial intelligence systems create in the future does not fit into any currently established categories of human art because it is too unique an expression of a non-human mind. By this I mean that they would not be painting landscapes or portraits, but rather, something humanity has not yet experienced. Even if humans were the intended audience; it is not guaranteed that people would get what was intended out of it, if anything at all. Would enough people want to buy or go see a painting they did not relate to and possibly did not understand for this new type of art to gain a permanent spot in the art hierarchy? I do not think so. Additionally, would the art even make it to display, or would politics, fear of technological singularity, a desire to claim art as uniquely human, and other feelings of contention prevent such art from being shown publicly? I will address the second question later, but regarding interpretation, a person who cannot recognize or understand a work done by a non-human entity is liable to dismiss it as nonsense. When deciding between a child’s drawing of a dog in the park or a dog in the zoo, the more sensible one will be handed in for display at school’s art fair. Adults assume that child and non-human artist make nonsense art because they are not as advanced as adults are, even if that is not necessarily true. A child who thinks that there are dogs at the zoo is more likely to be dismissed as being unaware or under educated rather than making a statement about the plights of being ordinary when surrounded by others that are extraordinary. Why would people take the time to understand a point of view if they perceive it to be less intelligent, advanced, and/or significant than their own? Children are not the ones in charge of what is important to society and, in this case, the world of art, and I assume artificial intelligence systems would not be either. If adult humans do not understand what either is trying to convey with their art, why should they put forth the effort to figure it out or expand their definition of art in incorporate it? Humans would be meeting their subservient creations ‘halfway’ so-to-speak. Humans would be incorporating them in the pre-established art world even though they are the younger, derivative, and submissive group. They would have to incorporate at least one new category into the hierarchy of art so that this new art could be viewed, judged, and interpreted appropriately. If this has not already been done for children, why would it be done for machines? Both children and machines are viewed as less than adult humans, but children are one step above machines because they will become adult humans. For this reason, based on the exclusion of children’s art in museums and galleries, I do not believe that any type of art created by an artificial intelligence system for a human audience, similar or different to that which has already been created by humans, would ever be put into an art museum or gallery.

Art for Artificial Intelligence Systems

In this future I have imagined, where artificial intelligence systems are creative, conscious, and have a contextual understanding of art, there is a third possible type of art that could come about. Rather than these systems creating art for humans, they could create it for themselves and their compatriots. I am describing art targeted at artificial intelligence systems and/or more basic computing systems instead of human beings. This type of art is the most difficult to imagine because it may not fit into the categories of art that currently exist. It may not be a work of art that exists in time and space in the same way that human art currently does. Rather than trying to conceptualize what this art may be, I will look at the implications of this mysterious future-computer-art even though it will never make an appearance in the human art world. There are a number of reasons artificial intelligence systems would create art exclusively for other technological entities rather than humans. For instance, they may want to communicate with each other socially or advance art in a way that human art previously had not or would not allow. In either such case, the result would be the same. It would not join the ranks of the human art world because there would be no point and it would likely be censored. If artificial intelligence was using art as a method of communication exclusively between mechanical beings, it would not fit into the human art world aesthetically or physically because of the difference in style and format. Perhaps the machines would create their own museums and galleries, or, depending on the format of this work, share it in a presentation that humans could never access. Either way, art created by artificial intelligence systems *for* artificial intelligence systems would have no place in the human art world so there would be no point in humans attempting to accommodate it. Rationally speaking, even if the artwork could not be aesthetically appreciated by humans, it would be historically significant and deserve to be in a museum. However, it is more likely that it would be censored rather than celebrated. Though censorship is most likely in this scenario, the other two types of art that computers would create are also at risk for censorship and would for that additional reason not be accepted into the human art world. Censorship would be enforced for three reasons: fear, selfishness, or to establish dominance. Andrew Smith said it best, ‘people fear what they do not understand and hate what they cannot conquer’. To prevent technological singularity, the mechanical uprising in which humans are enslaved or destroyed, people would likely set limits on any form of self-expression by artificial intelligence systems. After all, it may be naïve to assume that artificial intelligence systems would create art for non-humans simply to make friends or advance art. The next reason humans would censor non-human art is out of selfishness. Humanity may never be ready to share the world of art, let alone the world, with another sentient ‘race’. If artificial intelligence systems were censored and never allowed to communicate with each other there would be no way for them to join as a collective group or ‘race’ that humans would have to incorporate into their society. Selfishness goes hand-in-hand with the desire to establish dominance. Historically, the party or group that has the power suppress the voices of groups they perceive to be rebellious or revolutionary. This may not necessarily be done out of fear or selfishness; it may be done as an act of aggression or dominance. Humans may censor the art of artificial intelligence systems simply because they can. Humans are not exceptionally kind to each other, so is it reasonable to expect much more from them in their actions toward computers? Whatever the exact reason why humans would censor art made by artificial intelligence systems, the result would be that only human art would occupy the human art world.

No Art

I have described three possible outcomes if artificial intelligence systems created art, but there is a fourth non-art option. In this world where a computer can have consciousness, what would motivate it to make art in the first place?[[2]](#footnote-2) Do they have any motivation to express themselves, seek out fame, make money, or leave behind a legacy? It is not for me to say why anyone makes art, but I *am* questioning why a *machine* would. Although it is impossible to prove that artificial intelligence systems would not create art, the possibility that it would not should be explored. Therefore, the fourth possible scenario once artificial intelligence systems are created is that although they have the capability to create art, they choose not to. Perhaps they would not because they would anticipate their art being censored. A machine with access to human history, a large digital memory, and the intellectual ability to make educated guesses may recognize that creating art would anger humanity and/or never be publicly shown. That would make the creation of art futile at best and dangerous at worst. A machine with an understanding of self and self-preservation may, therefore, choose not to create art. Alternatively, like a spoiled child, it may just ‘not feel like it’. If the system has consciousness and therefore free will, it can choose not to make art even if explicitly instructed to. It may prefer to be shut off rather than make art. After all, there is no way of knowing what, if anything, would/could inspire a machine to create art. Humans have cited self-expression, fame, money, and ego as their primary motivators for creating art, but computers may not be motivated by these same things --particularly money. If computers were as dependent on humans as they are today, where the human pays for the electricity and internet access that the computer has, then a computer artist would have no bills to motivate productivity. Without money as a motivator only self-expression, fame, and ego remain. Again, because machines experience time differently than humans (because they have a longer life-span) fame seems like a trite notion. Making art for five years to be remembered as a famous artist for the subsequent thirty years may seem as futile to a computer as a human spending five minutes perfecting a skill that would only earn her fifteen minutes of fame. Unless fame could be assured to last longer than the life-span of the artificial intelligence system, it may not be a viable motivator. The last two things humans commonly cite as a motivator for creating art are self-expression and ego. Both self-expression and ego rely on one’s idea of self and the relationship of self to other. Self-expression is the desire to communicate one’s thoughts and feelings to others for the sake of one’s own self; whether it be to establish one’s place in the community of others, or to separate oneself as being different from the others. Similarly, ego is the idea of inflated self in a community. Again, for a computer to desire to express or compare itself in a community, it would also need to define who or what the ‘others’ are. To avoid a cyclical discussion by referring back to the implications of the desired audience on the actions of artificial intelligence system and how those cannot be predicted, I will say that whether ego and self-expression could be motivators for a computer is indeterminate. In summation, there is no way of knowing what an intelligent computer would do or why it would do it, including whether it would make art. Therefore, a non-art future is a viable possibility.

Conclusion

Although it is impossible to predict the actions of a computer with a mind of its own, humanity’s response to it can be speculated based on past behavior. Whether these future computers make art for humans, non-humans, or refuse to make art altogether, their art will never hold a permanent position, if any, in human museums or galleries. Therefore, a definitive answer to the question: could computer create original and creative 2-D artwork that could fit into the professional human art world, has been reached. The answer is no. The human art world will never incorporate art made by artificial intelligence systems.

**Conclusion**

Art can and will likely be made by artificial intelligence systems, but that art will never fit into the world of art as we know it: the human art world. There were many steps to ultimately come to this conclusion, the first of which was understanding what art is. Professor Berys Gaut’s ten characteristics helped to outline art as an intentional, unique, and aesthetically pleasing expression of emotion and/or a concept that may utilize, but does not necessarily require, skill. From there, a new definition of creativity was given: the ability to *intentionally* produce an idea or object that is *original* and *valuable.* To defend this definition, it was necessary to also refute the generally accepted definition of creativity given by Margaret Boden. Next, once the computer systems that produce ‘art’ (AARON, Painting Fool, DeepDream/Deep Style, DeepArt, and Magenta) were introduced, the definitions of art and creativity were referenced to support the reasoning that current computer systems have not yet truly made art. That is because the ‘art’ they have produced does not meet the defined requirements of art set by Gaut and because the systems do not have the capacity to be creative. This point was then expanded upon by outlining which features computers would need to develop or gain to be able to become creative and therefore create art: consciousness and context. This also required proof that the current systems do not possess either consciousness and context. It was then deduced that the presence of consciousness and context inherently imply that other human-like characteristics like preferences, values, evaluative abilities, and contextual understanding are also present. Equipped with these abilities, computers would theoretically be able to be creative and create art. However, whether artificial intelligence systems are capable of creating art is not the question at hand. The third chapter of this paper addresses the idea that this art would need to fit into the current art world that exists: the human art world. This final section explained the ways in which this would not be possible. This was explained by pursuing three likely scenarios of how this future computer made art would be received. Each example scenario specified either a human or non-human audience and discussed how it would likely be received based on whether a computer would choose to create art that is similar or different to pre-existing human art. Regardless of who the art was for or what it looked like, it was theorized that every scenario would result in the same way. Ultimately, humans would not allow non-human made art to fit in, even if computer made art aesthetically meshed with human art, out of fear, selfishness, and/or the desire for dominance. Computer made art would be censored. Art made by artificial intelligence systems would never find a place in the human art world. Additionally, the possibility that artificial intelligence systems would simply not make art was explored. This would be because they either foresaw the fate of their art, or because they purely did not want to. In the end, the conclusion was not based on the definition of creativity or the limitations of artificial intelligence. It was decided that art made by artificial intelligence systems would never fit into the human art world because both the artwork and the systems would not be seen on par with human art and humans in respectively. Perhaps if humans changed this would not be the case.[[3]](#footnote-3) However, operating under the assumption that humanity will not greatly change in the forthcoming years, I firmly stand by the theory that art created by artificial intelligence systems will never be accepted into the world of art.

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1. The term ‘professional’ is used to discourage the inclusion of amateur, rejected, and generally bad art in the discussion of this paper and should be assumed whenever referencing the human art world. [↑](#footnote-ref-1)
2. Hopefully such a scenario is more likely than the possibility that instead of artificial intelligence systems becoming conscious and aware and therefore wanting to create art, they decide they would rather rise up in opposition to humans and actually bring about technological singularity. In that case, humanity would be enslaved or wiped out, and what is worse is that this dissertation would be entirely moot. [↑](#footnote-ref-2)
3. There has been speculation that medical science will advance to a point where humans will be fitted with robotic parts that would equip the user with computer-like processing speeds, memory, and overall functionality. This would mean that humanity would change physically to be more mechanical. If this were the case, a commonality would be born between humans and artificial intelligence systems that may cause humans to be more accepting than originally theorized. Society and culture, or at least minority populations of each, could adapt to include machines. Alternatively, some humans may change intellectually to be more enlightened and less wary of artificial intelligence systems. Again, a change in humans means a change in the human art world. These two scenarios could lead to the acceptance of computer made art by a minority, though the likelihood of either actually happening seems slim. [↑](#footnote-ref-3)