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Art, Aesthetics, and Artificial Intelligence

Edited by

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CONTENTS

Introduction

In the winter of 2022, with the launch of ChatGPT and the pursuit of advancing Large Language Models, artificial intelligence (AI) and machine learning quickly appeared in the mainstream of the social, scientific, and artistic debate. While the use of AI in social and scientific development is widely accepted and advanced in art and creative work, the presence of AI is not so obvious and undisputed. Many artists reach for AI as a tool enabling them to accomplish their artistic intentions. At the same time, AI is not original and has already raised plagiarism and copyright problems within the context of the arts, including visual art. Still, the output generated by AI in the role of a non-human automatic agent significantly impacts an audience's imagination. For many recipients of art, this is proof that also, in this sphere, human, technical skills can be replaced by machines. More and more often, there are voices that the artist's profession will soon share the fate of such non-existent professions as carriage makers, slubber doffers, pin setters, or knocker-uppers. In a more moderate version, there is a widespread opinion that an artist's work will be fully automated and—to quote the words of José Ortega y Gasset—dehumanized. On the other hand, AI technology enthusiasts argue it may be time to humanize the algorithm, recognizing its ability to produce artifacts and independently create new art, which in its aesthetic values and impact is equal to the achievements of non-computational human artists.

Research published in "Empirical Studies in the Arts" in 2022[1] shows that most people are unable to recognize the differences between images created by artificial intelligence and humans. The inspiration for the study was the sale of the portrait "Edmond de Belamy," created by an algorithm developed by the Parisian collective Obvious and sold in 2018 at Christie's auction house. Even though the painting was valued at $7,000-10,000 before the auction, its final price was $432,500. The author of the study, Harsha Gangadharbatla, prepared a survey in which participants had to distinguish between two types of works. Some of them were created by two American

[1] Gangadharbatla 2022.

artists, Tom Bailey and Steve Johnson, who prepared impressionistic landscapes and geometric abstractions, the other part of the works was created by one algorithm.

Hundreds of people participating in the study were able to correctly attribute only one of the five landscapes to artificial intelligence. More than 75% were wrong about the remaining four. The respondents coped slightly better with abstract art, which may indicate that abstraction is identified with artificial intelligence, and landscapes are believed to be the work of a human hand.

Philosophical discussions about art created by AI and algorithms usually center around what is known as generative art. New media researcher Philip Galanter writes that "Generative art refers to any art practice where the artist uses a system, such as a set of natural language rules, a computer program, machine, or other procedural invention, which is set into motion with some degree of autonomy contributing to or resulting in a completed work of art" (2003, 4). Generative art defines unique and unpredictable events and entails new artistic processes and challenges. Artistic creation does not serve so much to create artifacts as a program constituting a new natural and artificial environment. Undoubtedly, art created with the help of a special program and AI technology recontextualizes our understanding of skills and art. It does not exactly reproduce existing forms but gains the potential to create new phenomena based on existing artistic practices. This probably implies developing art as a creative practice within all existing fields. Still, at the same time, it brings numerous challenges and questions of a philosophical and aesthetic nature, such as the art of "prompt engineering," which may be compared to an emergent genre of text, such as poetry and prose.

We hope that the articles collected in this special volume will contribute to the development of the current debate on the relationship between artificial intelligence and art. However, this development does not always mean providing final answers to the questions generated by this contemporary phenomenon. The development of the debate on the presence of artificial intelligence in the world of art and culture today means, above all, asking important and fundamental questions about the future of these areas of human activity and creativity.

To this end, we invited researchers to explore the relationship between art, aesthetics, and artificial intelligence. In this volume of *The Polish Journal of Aesthetics* we posed some basic questions such as what is AI creation?; is it a work of art?; how is the status and understanding of works of art changing in the age of AI?; how is the status and importance of artists changing in the

age of AI?; is AI an artist?; to what extent can AI-generated art be considered original or creative?; who is responsible for AI-generated art, and who owns it?; will AI art reflect the biases of its creators and perpetuate existing inequalities?; how is the understanding of traditional artistic and aesthetic values changing with AI?; does the aesthetic experience of works create by AI change, and how?; does the awareness that AI created a given work affect its reception, and how?

We invite all readers to search for answers to the above questions and reflect on the meaning and presence of AI in contemporary world of art and culture.

Natalia Anna Michna

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Thorsten Botz-Bornstein*

Do Computers Ruminate? On the Impossibility of "Thinking-Feeling" in AI Art

Abstract

Artists do not simply think and feel but incorporate feeling into their artistic thinking process or thinking into their feelings. The computer's problem is neither that it does not think nor has any feelings (it might have some one day). The difference between a human drawing and a robot drawing is thus not that the former thinks and the latter does not. What matters is the "ruminating" aspect of creation that Wittgenstein alluded to, which Mondrian defined as thinking-feeling. I analyze the importance of randomness in human art and AI art.

Keywords

Midjourney, Mondrian, Complexity, Randomness

The year 2022 impressed the world with two spectacular technologies: the chatbot ChatGPT, which creates texts that seem to be written by humans, and Midjourney, which generates colorful images through the understanding of text prompts. Both are natural language processing tools. DALL-E, Imagen, Stable Diffusion, Microsoft's NUWA-Infinity, NightCafé, and Craiyon, plus a large sub-industry that permits quick online use, offer similar services. Midjourney also allows the inverse approach: clients can upload their images and then have Midjourney create prompts that can be used to create new images.

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ChatGPT demonstrates that AI can think and write like humans or simply better than most humans, and Midjourney is better at visual imagination than 99 percent of us mortals. The question is: can AI produce art? Midjourney is not trying to be photorealistic but emphasizes painterly aesthetics (with a dominance of orange), and DALL-E's name hints at the painter Salvatore Dali. Midjourney art already won an award in a US state fair art competition, which made the techno website Techradar enthusiastically claim that these works should "hang in the Louvre" (Metz 2022). Writer Marcus du Sautoy finds that "AI is quite successful in poetry because it's able to create something that leaves enough ambiguity so the reader can use a lot of their creativity to bring the poems to life" (Samuel 2019).

Humans have taught computers various skills, including drawing and painting. Since the 1960s, computer graphics began creating configurations using an acquired repertory of visual signs. By applying increasingly complicated algorithms, computers became increasingly "creative." John Whitney used mathematical operations to engender artistic images, and Desmond Paul Henry experimented with machine-generated visuals. In 1968, Robert Mallary created the first digitally modeled sculpture, Quad 1. Many of these early digital artists desired to combine science and art. Protagonists of early computer art (which was then called "analog design"), such as Georg Nees, Frieder Nake, and Michael Noll (the "3 N"), relied on mathematical methods. Computer artists like Charles Csuri, Manfred Mohr, Vera Molnar, and Harold Cohen developed more fine arts-oriented approaches.

Since the 1980s, the digital art scene has been populated by artists with a painting background, a film or photography background, or a math and computer science background who experiment with algorithms. Most of the time, digital and traditional artistic means were mixed, and already at a very early point, the evaluation of human input versus computer input created dilemmas. Harold Cohen developed programs "without necessarily having any idea what the final result will be" (Popper 1993, 80). Frank Popper already noted that "the computer becomes a creator or perhaps a simulator of memory, of reasoning and of the brain itself." The computer "almost creates" the image.

More recently, computers have begun operating with machine-learning programs and artificial neural networks able to imitate the neural functions of the brain. These tools produce entirely autonomous interpretations of objects, colors, shapes, patterns, and constellations. They also learn: Generative Adversarial Networks (GANs) pitch two neural networks (generator and discriminator) against each other and create a feedback loop to produce

better and better results. The Creative Adversarial Network system (CAN) reenacts a sort of dialectical thinking process: one neural net classifies images while another one tries to find data sets that challenge this classification. The outcomes are neither predictable nor fully controllable. In Midjourney images, tombstones pop up in a mall, a Hip Hop artist holds a cowbell, or a particular woman's face appears over again. Midjourney founder David Holz dryly comments: "We don't know where it comes from" (Vincent 2022). GANs have even created their own style, which Francois Chollet called "GANism," and made Paul Waelder say that AI art must be considered a conceptual art (Waelder 2020).

As computers can make relatively autonomous aesthetic decisions, it becomes increasingly unclear whether a human or a machine created the work. Of course, a human creates the programs and the dataset. Must the programmer, therefore, be considered an artist? In the 1980s, artist Michel Bret criticized useless software written by engineers who were not knowledgeable about art. When he created his own software, did he simply switch to another medium, from painting to computer code?

AI does not only have an infinite font of imagination; it is also knowledgeable about art. As it analyzes thousands of images through sophisticated agents of pattern recognition, it can distinguish specific styles and understand each work's creation process. AI is a good art historian or a good aesthetician. Do such skills automatically enable these machines to create art?

Feeling and Complexity

Why would we consider a machine-produced work as art in the first place? Should we not speak instead of "computational *aesthetics*," which includes functions, interfaces, and codes? Computers can produce and arrange elements aesthetically, often so beautifully and expressively. AI aesthetics can be visually captivating, but does this alone signify that the digital creation process overlaps with a human *artist*? Holz is very categorical: "It's important to emphasize that this is not about art. This is about imagination" (Salkovitz 2022). Midjourney is an "imagination tool" whose productions can be splashed on magazine covers or be used as memes. But mere imagination is not art. Holz seems to echo computer art pioneer Molnar, who claimed decades ago "that the computer can [only] encourage the mind to work in new ways" (Popper 2006, 69). Have we thus not essentially evolved—despite the more sophisticated technology—from the situation of

the 1980s where artists commonly saw "the computer only as a tool, as a canvas or a very elaborate palette with which to 'paint'" (Popper 1993, 80)?

Something makes us spontaneously think that computers cannot produce art. Computers have neither life experience nor sentiments. These two facts are often used to establish that AI art is not "real art" and that computers are merely good technicians. However, the problem is more complicated than the 'emotion versus reason' argument suggests. Art is not simply technique plus feeling with a little bit of reason added. Emotion, for example, is a problematic notion in aesthetics. Artists investing their life experiences and feelings into their works *too directly* can be considered bad artists or, depending on the degree, not artists at all. If the computer can do better than them, should its output not be considered at least closer to art than, say, a painting by Sophie Gengembre Anderson or some works by amateur painters found on Behance or Artsy? If the computer manages to push direct expressions and references through complex systems of deconstruction, alienation, estrangement, or diffusion, will the result not necessarily come closer to art? Why should we hold that bad amateur pictures are *still* art while sophisticated AI productions are not?

Others hold that computers do create art, and one of the most important keywords in such discussions is "complexity." What impresses us most in recently produced AI art is indeed the works' intricacy and ramifications. However, how important is complexity for art in general? Midjourney art often attains some surrealistic mysteriousness through complexification, which provides an artistic feel. The same method prevails in "conventional" digital art that uses Photoshop and 3D software. Only complexity can save the pictures of Maggie Taylor or Ray Caesar from being straightforward kitsch. When the creative processes underlying a work are so intricate that we cannot mentally retrace them, when the outcomes are so strange that we cannot entirely understand them, we are inclined to call the production art. Can it thus be concluded that once AI art is sufficiently complex, it must be considered art? I do not think so. The matter is a bit like astrology and pseudosciences, which try to obtain a status of science by becoming infinitely complex. However, complex pseudo-science is not yet science.

Though art is often "too much" for human understanding, this does not mean that artistic expression must always be complex. Much art is minimalistic and simple; contrary to what one could intuitively assume, minimalist art has often sought the emotional, empathic, and spiritual. Piet Mondrian's austere line art does not convey bland computerizable rationality. These

compositions have perhaps been mathematically calculated in their proportions, but they are not, as the painter often insisted, geometrically and rationally constructed. As a matter of fact, Mondrian did not want his lines to be perceived as geometrical at all but was principally interested in the creation of a *feelable* "visual rhythm." And this rhythm was, paradoxically, not linear for him. The rhythm of Mondrian's paintings cannot be measured but is, in the painter's terminology, a matter of spirit with a cosmic connection: "It renders more strongly the cosmic rhythm that flows through all things" (1986, 39-40). Similar statements can be found by Kandinsky, who wrote an entire book on "The Spiritual in Art" (1911) and found that his geometrical compositions, as minimalistic as they often are, contain inner, non-material forces (1991, 102). Can AI ever do this?

For Mondrian, the construction of straight lines—an easy feat for a computer—is not due to a simple act of thinking, nor is it mere feeling. It is rather due to a kind of "feeling-thinking, as Mondrian famously explained when saying about the artist: "When he thinks he feels, and when he feels he thinks" (1925, 27). For the artist, thinking and feeling are never distinct activities. This inequity is the difference: A computer can think, and a non-artist human can feel, but the human artist can bring both together.

I argue that artists do not simply think and feel but incorporate feeling into their artistic thinking process or thinking into their feelings. The computer's problem is neither that it does not think nor has any feelings (it might have some one day). The lack of feeling would not matter anyway, as good art with minimal feeling does exist. However, the computer cannot develop an artistic "feeling-thinking."

Even digital artists perceive this constellation. They use computers, but they program them in a way that they express their feelings. Frank Popper suggests that the vaguely Cubist art of digital pioneer Manfred Mohr "is not a mathematical art but rather an expression of his artistic experience. The rules he invents reflect his thinking and feelings" (2006, 68). In other words, the computer does not think for him, but he thinks for the computer, and in this way, his thinking is combined with feeling.

To clarify the meaning of "feeling-thinking," we must analyze the meaning of 'complexity.' As mentioned, complexity seems to be the most convincing parameter in recent computer art. First, we observe that the complexity we encounter in search-based AI art contrasts with that of pioneer computer art by Nees, Nake, Noll, and most others. Early computer art (and even early electronic art, as shown in Frank Popper's documentation from 1993) was informed by neo-expressionism and the formalist minimalism of Construc-

tivism and Neo-Plasticism that was in the air just at the time when computers became available. This art opted for geometric simplicity. In the best case, the geometric would blend with the organic. Such aesthetics, would it be *entirely* produced by AI software today, would most likely not be accepted as art but only as graphic design. When simple and minimalistic art is produced *only* by a computer, it will be found too bland. When we see works of reductive minimalism, we must be aware of human input. For example, we want to feel connected to a human being when looking at a painted color field by Elsworth Kelly. A Kelly-style painting entirely produced by a computer would not have the same "feel," and, consequently, it would not have much artistic interest. It means that Kelly's abstract minimalism is not merely the result of thinking. When seeing his painting, Kelly even suggested "turning off" the mind, saying: "If you can turn off the mind and look only with the eyes, eventually everything becomes abstract."[1] However, it does not mean that by being "only eye," the artist would simply rely on feeling; he rather unites thinking and feeling.

Fifty years onward, AI has dramatically changed the style of digital art by moving from the relatively minimalist abstract expressionism that so many digital artists had favored for decades to the highly concrete. The irrealistic realism of most Midjourney productions found online is particularly expressive through its concreteness. Art produced by graphic designers like Beeple, which is highly successful in the digital art scene, is inscribed in this tendency. It seems that simplification or minimalism is no longer the way to go. The main parameter that can save this art *as art* is "complexity." However, a simple aesthetic strategy like Mondrian's can appear strange and mysterious *because* of its simplicity. Mondrian even found that his paintings refer to the spiritual and the cosmic *because* of the utmost simplicity.

The evolution towards complexity was predictable. Algorithms do not do more than combine existing elements, and, creativity primarily arises through further complexifications of these combinations. In the earliest experiments with algorithms, the Bernoulli brothers (17th century) and the young Leibniz attempted to combine elements such as thoughts, numbers, and words. Leibniz identified the central concept of his strategy by giving it the title *De Arte Combinatoria* (1666). By producing an alphabet of human thought, the philosopher wanted to show that all possible concepts are mere combinations of some more basic concepts. Earlier, Descartes had presented

[1] The quote, dozens of times reproduced on the internet, seems to come from a *Los Angeles Times* article from 1991, which I could not trace.

a similar idea in the form of a universal language lexicon consisting of primitive elements whose systematic combination could represent human language (Descartes 1629). But Leibniz also called his technique "art," which is telling. *De Arte Combinatoria* is supposed to provide a logic of creative invention. Four hundred years later, algorithms offer very complex combinations, and the more complex they are, the more we are tempted to think that they are genuinely creative and perhaps even art.

The brain is complex, and so is art, which can lead to the false conclusion that when aesthetics attains a certain complexity level, there must be some artistic thinking behind it. We are affected when the artistic results cannot be clearly retraced to the sources that inspired them. A complex work's beauty looks less like a mechanically produced or crowdsourced. One could apply a "complexity test": When AI presents images that are not immediate derivations of something preexisting but visual elaborations that remain mysterious and inexplainable, we are ready to agree that this is art. However, things are not that simple.

Certitude and Incertitude

In the 1950s, the Turing Test attempted to establish whether a human or machine enacts a specific behavior. A human evaluator judged conversations between a human and a machine, and if the evaluator could not reliably tell the machine from the human, the machine would be said to have passed the test. Today's ChatGPT would pass the test. If there were an "art test" that attempts to distinguish human-made art from AI art, it could be based on complexity features with the result that much AI art would pass the test. However, as I said above, complexity is not essential for art: much art is simple. Therefore, I want to go beyond the complexity theme and put forward another parameter that I believe is crucial for art: incertitude. An artist is never sure of what they are doing, whereas a machine, once it has come to a particular conclusion through processes of calculation and quantification, is simply confident that this is the only sentence it wants to write, the only line it wants to draw, the only color it wants to apply. A "real" artist can never be sure. To distinguish human art from AI art, we would thus need an "incertitude test."

The complexity achieved by AI is extraordinary, but to an overwhelming extent, it can be obtained through massive quantification processes; all quantification leads to certitude. Is there a method that leads to *in*certitude? By incertitude, I mean two things. First, the incertitude of the artist about

their expression. Can they be entirely certain that this line is exactly where it should be? They were struggling to find the right shape or the right word. When they finally find it, they might find the line or color sufficiently appealing and apply it, but they will not believe it is the "right" or "correct" decision. Some uncertainty persists, and this incertitude is, first, part of the artistic expression; second—and this is my main claim—it is part of the viewer's aesthetic experience when seeing the work. We feel the artist's struggle and that lines were not calculated but only approximatively put. Once the line is drawn, it does not claim to be the only right and necessary solution, but its randomness remains virtually present. We not only feel the work's necessity but also the haphazardness. There were many options, and though the final option that the artist chose is good, it does not mean that all other options were "wrong." Completely different constellations could have occurred, in which case all options would have changed. Real art is floating. No "necessity" is *absolutely* necessary, and the artist (as well as the viewer) is constantly aware of the imperfection of their choice. They could have drawn the line otherwise; this "could" remains part of the artistic expression or simply of what makes it art. There subsists a mystery about the act of creation, which Wittgenstein attempted to grasp when writing about the art of drawing: "Think of the behavior of one who draws the face by considering its expression. Think of the face and the movements of the one who is drawing. How does it become manifest that every stroke he draws is dictated by the face and that in this drawing nothing is arbitrary?" (VB entry from 1946). Drawing a line is not due to a simple affirmation reached through quantification. Some arbitrariness persists: a sort of marveling skepticism is part of the aesthetics, and this marveling can be transmitted to the spectator. The mystery about the act of creation should not be confused with the mysteriousness of the expression. Mondrian's lines are not mysterious as such, but the way he found the right proportions and constellations remains mysterious, eventually making the lines mysterious. They do not have the same mysteriousness when drawn by a computer.

Randomness

AI engineers are deeply aware of these problems. Contrary to science, things are not sure, necessary, or absolute in art, so randomness becomes an essential component of AI. When AI attempts to write like a human, in a way of speaking, it wants to pass the Turing Test. But what does it mean to write like a human? A commonsensical answer is writing sentences exactly how

one would expect a human to write. The problem is that humans—especially artists—do not always write how they are expected to. Humans are somehow or other artists, and art tends to produce the unexpected. When art only blandly reinstates our most common expectations, it is bad art, kitsch, or non-art. The AI designers of ChatGPT are attentive to this problem. Even ChatGPT, which is not destined to produce art, must consider the "aesthetic" problems discussed here. Once the chatbot has been fed with an element (a token), it sets out to produce the next element and to do so, and it establishes a ranked list of the possible following words based on the quantification of what has been said before in similar contexts. But should it systematically choose the most likely option (the highest ranked element), the text would precisely *not* look like a human wrote it. Stephen Wolfram explains that AI must not systematically choose the highest-ranked option to think or write like a human: "If we always pick the highest-ranked word, we'll typically get a very 'flat' essay, that never seems to show any creativity. But if sometimes (at random) we pick lower-ranked words, we get a 'more interesting' essay" (Wolfram 2022). We need randomness to be creative or at least appear creative. Wolfram calls this technique, which introduces complexity into texts, voodoo, which means that science cannot grasp it. It is a purely practical approach with no theory behind it: "In keeping with the idea of voodoo, there's a particular so-called 'temperature' parameter that determines how often lower-ranked words will be used, and for essay generation, it turns out that a 'temperature' of 0.8 seems best."

The importance of randomness is not an original discovery. When algorithms were used to compose music by following the quantified rules of musical trends, it was quickly found that this approach "ignores the disruption which is part of the artist's business [because] there will always remain a contingent and chancy part" as said the director of the French IRCAM Franck Madlener (Carpentier 2021). Suprapersonal algorithms absorb those elements that emerge randomly, for instance, ingenious ideas and on-the-spot metaphors. Already, digital pioneers like Molnar were aware of the importance of randomness. Molnar tried to "make the accidental or random subversive in order to create an artistic shock and to rupture the systematic and the symmetrical," comments Popper (2006, 64). One of Molnar's works was called "One Percent Disorder" (1976). Manfred Mohr even insisted on parametric rules that appear to be similar to the AI rules pointed out above: "Even though Mohr's work process is rational and systematic, its results can be unpredictable. Random decisions are switching points that ensure a value-free method of moving the program ahead" (Popper 2006, 67).

Continuing this tradition, contemporary AI introduces randomness through various techniques. GANs pitch two neural networks against each other and obtain random results. The diffusion technique used by Midjourney and others scrambles images until they become pure noise. Then, neural networks change the noise into an image, effectively generating randomness. Interestingly, the above "imperfection measures" are necessary not only for art but also for the production of pictures that are supposed to look realistic. Algorithms use a "fitness function" to decide if, for instance, an AI face shows enough similarity with a real face. But again, "the final works that are presented are not the most accurate ones but are ones with an intermediate fitness value" (Johnson 2021, 35). Not the highest fitness value should be chosen, but an intermediate one. Also, in neural networks trained to recognize objects (called deep dreaming images), the network "is cut off a few stages before converging on an accurate recognition of a scene" (36) to enforce randomness and, finally, to obtain a more convincing reality effect. By importing randomness, AI distorts straightforward thinking processes such as calculation and quantification. It wants to produce the illusion that here, not only thinking but perhaps some "feeling" also impacted the expression.

Noll could transform a picture by Mondrian into numerical data and then transform the code back into a picture. In 1966, Noll undertook an "art test" using Mondrian's "Composition With Lines" from 1917. With an IBM 7094 computer using "a trial-and-error approach," he produced a picture similar to Mondrian's (1966b, 72). Noll suspected Mondrian of following some unknown scheme or program. Noll put the result next to the original picture and asked 100 subjects to indicate which one they believed to be the original Mondrian. He also asked them which of the two they preferred. Only 28% correctly identified the computer-generated picture; 59% preferred the computer-generated picture.

For Noll, the "success" of the computer picture was due to randomness. The majority preferred the computer composition because it was more random than Mondrian's. Computers were expected to produce mechanical, orderly pictures, and many "were fooled into incorrectly identifying the Mondrian as being the computer picture" (1966, 72). The computer picture was found more "imaginative." Human creativity was associated with randomness, and the random algorithm was more attractive than Mondrian's more orderly pattern. However, as Noll quickly points out, the randomness introduced by the computer was "completely deterministic, and the resulting pattern is mathematically specified in every detail" (9). It was not "real"

randomness. Noll also believed that the computer should "mix together randomness and order" (1966b, 73), as entirely random pictures are not interesting.

Noll did not ask a follow-up question. Would people, once told that they had been tricked into preferring the computer Mondrian, still stick to their choice? Is the fact of knowing that there was an artist or a computer behind the work decisive for our aesthetic appreciation? From my above argumentation, it emerges that it is. Once we know that the randomization process is artificial, we no longer have the same "feeling" for the work. We no longer have the same aesthetic experience.

Art cannot only follow the necessary rules, but it needs randomness. However, artificially produced randomness is not identical to human-produced randomness. The old question of whether nature or animals can produce art expresses this problem. There is randomness in a weather-beaten rock or a picture drawn by a chimpanzee (see Saw, 49). But these productions will still not be recognized as art because here, no artist has produced random options. It is nature that randomized options and then picked one. There is no tension and no incertitude in the mind of an artist about what the right option could or could not be. There is no thinking-feeling, so the result cannot be traced to a creative process. Though AI has sophisticated quantifying and randomizing techniques, in principle, it cannot do better than the weather and the monkey. So, what is a human artist doing more precisely?

Play

To answer this question, we must approach AI art from another angle: play. Through randomness, a rationally and logarithmically constructed text begins to "play." By lowering the "temperature" or "diffusing" images, the workings of AI come closer to that of a game. Games are not straightforward or wholly utilitarian. Their results are unpredictable, similar to the artistic production process. We cannot follow the movements of a game as if they were mere necessities because, to some extent, they depend on contingency. A more philosophical way to express this is to say that skepticism undermines any straightforward action in a game. When Molnar, Mohr, Noll, or AI incorporate incertitude, they employ systemic doubt. AI *doubts* that the highest-ranked response to a token is the best option and chooses a lower-ranked one. This approach comes closer to human thinking, and the result passes the Turing Test. But it is still not identical with human thinking, espe-

cially with artistic human thinking. Though AI moves closer to human creation, there remains a difference. AI's artificially created doubt is not a persisting doubt but merely a Cartesian "useful" doubt that eventually looks for certitude. The lower-ranked option will be considered the "better" option, and here, all skepticism ends. By contrast, in human-made art, the doubt remains.

Doubting is human. Doubting gives freedom and is part of the human condition. Usually, humans do not move around in a universe of certitude. When it comes to art, this becomes particularly obvious. Doubting permits us to marvel at art. Through doubt, we come closer to a work's meaning. We understand something though—or just *because*—we cannot fully grasp its meaning. This uncertainty establishes a vital difference with machines. Machines can doubt, but they cannot doubt forever. They must come to a final conclusion; otherwise, their mechanism breaks down or they are stuck in an infinite loop and cannot stop. Quantifying computer software, no matter how complex, always arrives at a "final" conclusion, at a certitude. It introduces skeptical, playful devices such as the change of "temperatures" or diffusion but cannot incorporate and express constant doubt. Its doubt is Cartesian *methodological* skepticism, which differs from philosophical skepticism. Philosophical skepticism radically questions the possibility of knowledge and develops skepticism not merely as a method but as an attitude. This skepticism is also the artistic or hermeneutic attitude we can develop in interpretations.

Artistic creation is based on philosophical skepticism. Art evolves through constant doubt, whereas AI is cartesian. It is no coincidence that Descartes was fascinated by mechanistic interpretations of life. His 'animal = machine' paradigm, defined in Part V of the *Discourse on Method* (1637), explains animal behavior in terms of the necessities dependent on the disposition of the animal's organs. No doubt interferes with these mechanics.

With regard to machines, no philosophical doubt is possible, even if we randomize the functions. But art cannot be reduced to mechanical models, so it cannot be produced by algorithms, not even the most complex ones. Art does not find solutions but makes suggestions—eternally imperfect suggestions.

The difference between a human drawing and a robot drawing is thus not that the former thinks and the latter does not. What matters is the "ruminating" aspect of creation that Wittgenstein alluded to in the above quotation, and which represents what Mondrian defined as thinking-feeling. The computer does not ruminate. The British artist collective "Tracey" suggests

that drawing is always "uncertain, defiantly idiosyncratic, marking specific difference rather than aspiring to universal values, stubbornly refusing resolved forms, and incorporating the principle of erasure—the will to unmark" (Tracey, xi). It means that the drawing-erasing sequence inherent in drawing contains a kind of skepticism. Drawing is, by definition, unstable. Drawing is ruminating. The line, the shape, or the artistic choice are due to a complex ontology that the Tracey collective pertinently describes as such: "At the moment at which the point (of the pencil) makes contact with the surface, we cannot see (literally or figuratively) what is about to emerge, and yet the point anticipates the memory of what has been seen in the past: it both stops and anticipates what is to come" (xvii).

Thinking in Images

We note a further difference with AI art. The computer thinks in images. Within seconds, it "imagines" existing images, chooses the right ones, and combines them following a complex "Arte Combinatoria." This process differs from human art production. Holz says that Midjourney is an imagination tool. The artist does not have such a tool. When the artist chooses lines or figures, they do not necessarily imagine them beforehand; they simply draw them (while ruminating). The used elements do not have an objective or subjective (imagined) existence before they are drawn. "We cannot see (literally or figuratively) what is about to emerge," says Tracey (xvii). In short, creating is not about the combination of existing elements. In the rumination process, the elements are not yet objectified as images but are only "thought-felt." When they finally appear on the paper, they are manifestations of a not-yet-objectified consciousness dependent on constant affirmation and negation processes or of belief and skepticism.

AI's objectifying process becomes most apparent when considering that Midjourney and DALL-E do not even think with images in the first place but with words. To create an image, the artist must suggest a prompt such as 'Image in a Japanese room, window, flowers, wabi-sabi, red.' The human artist does not work with such text prompts. They have a vague idea of something not yet materialized as an image-option. They have a thought that is only a feeling.

Jacques Derrida describes the human process of drawing as such: "The thought of drawing [is] a certain pensive pose, a memory of the trait that speculates, as in a dream, about its possibility. Its potency always develops on the brink of blindness" (1993, 2). The fact that the element lands on the

paper the way it does is not due to an act of affirmation but to an act of perpetual skeptical speculation. This action differs from a computer that merely recuperates, chooses options, and perhaps complexifies them. The artist involves the lines in a thinking process, meaning they do not think about the lines but instead think with the lines.

We can also say that drawing unravels itself like a game. Art is not construction but an organic development that breeds or unfolds itself through an artist. Tracey says that the artist relies on the drawing's "breeding quality." Similarly, Newman and Zegher write in their "Drawing Papers" that drawing is "necessary thoughtlessness" (2003, 36), which means that art is not produced through a conscious thinking process that chooses from a list of options nor through text prompts. The artist does not consciously know what they are doing and seems to play a game.

Art is due to some half-conscious, automatic bodily function, so computers will never be able to produce art. Art does not follow the human mind but has its own mind or plays its own game that the artist "feels;" to some extent, they play the game of creation without knowing what that game is. Computers cannot do that: they need objective tokens that they can choose from, or they need prompts. Furthermore, they process them following defined rules. The skeptical methods of randomization that AI introduces (due to a *methodological* skepticism) try to blur the fact that the system chooses from a range of objective options and follows rules. However, despite the complexity, it remains a fact that Midjourney thinks in images or words.

Conclusion

I said above that art never finds solutions but makes suggestions. Let us go one step further. The doubting activity essential to art is often linked to an existential questioning about the world and the cosmos, which is how art can sometimes acquire the "spiritual" component that Mondrian and Kandinsky mention. Frank Burch Brown writes that art is not merely a virtuosic display but can "convey a sense of what matters most in life and in the cosmos as a whole" (1989, 113). "Imagination" acquires a status that Holz and the Midjourney creators probably never considered. Saint-Simon reminded French revolutionaries that "the 'men of imagination' were [once] set up as magi, prophets, or diviners of a revelation" who have insights into the "depths of nature or of the soul" (Gauchet 1998, 34). One does not merely imagine and combine shapes and colors, but the aesthetic sign has a transcendent power. Brown writes that art can "fictively represent, and imagina-

tively transform 'worlds' in a revelatory or prophetic way" (103). This description sounds more like the above thinking-feeling. I am not saying that art *must* have visionary and prophetic dimensions, but the fact that it *can* have such dimensions shows that algorithmically established art, even when it is very complex and has been pushed through an "Arte Combinatoria" or neural networks, will always essentially differ from human-made art. What is needed for art is not a Cartesian mechanism that explains the world in terms of necessary rules but the will to express the inexpressible and, thus—logically—to incorporate enduring skepticism into expressions.

Last, it should be said that the recent algorithmic productions of art fit into a neoliberal world that quantifies and patterns desires, beauty, and everything else. The modern world has adopted creativity as a motto of "self-realization" for individuals, institutions, and companies. Here, AI is expected to help. In a neoliberal world, everybody is supposed to think "outside the box." Randomizing technology and complex GAN mechanisms are supposed to push the AI mind out of the box. However, the above analysis has shown that AI stays inside the box. As Johnson says, "The drivers are almost always decided before the search process begins. By contrast, the human artist appears to generate these during the development of a work, drawing on a lifetime of experience, knowledge, and emotion" (2021, 52). Therefore, eventually, AI imagination cannot produce "prophetic" statements about existence, the soul, or the cosmos. For AI, imagination is merely a "useful" value, which is also why it produces "art" that is not skeptical but that looks for certitude. Byung-Chul Han writes that "neoliberal psychopolitics seduces the soul; it pre-empts it in lieu of opposing it. It carefully protocols desires, needs, and wishes instead of 'depatterning them'" (2017, 36). This politics seeks confirmation, and AI art is following and serving this culture. Instead of considering various possibilities, one wants results. Instead of infinite speculation, one wants certitude.

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Interpreting AI-Generated Art: Arthur Danto's Perspective on Intention, Authorship, and Creative Traditions in the Age of Artificial Intelligence

Abstract

Arthur C. Danto did not live to witness the proliferation of AI in artistic creation. However, his philosophy of art offers key ideas about art that can provide an interesting perspective on artwork generated by artificial intelligence (AI). In this article, I analyze how his ideas about contemporary art, intention, interpretation, and authorship could be applied to the ongoing debate about AI and artistic creation. At the same time, it is also interesting to consider whether the incorporation of AI into artistic creation marks a new chapter in the narrative, which seems to have reached its end, or if it represents a significant rupture with past artistic traditions.

Keywords

Arthur Danto, AI-Generated Art, Authorship in AI-Generated Art, Intention in Art, Interpretation of AI Art

Artificial intelligence (AI) has grown enormously in the last few years. The world is surprised by the application and the extraordinary results that AI has produced in the artistic field. Indeed, this development has pushed substantial debates about whether it is possible to call the productions made by AI "art."

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In the theory of art, the practice of art is usually understood as something exclusively human, related to intentionality, emotions, and creativity. In the case of AI-generated art, is it possible to find intentionality, expression of feelings, or originality in a creation? It seems easier to be affirmative when discussing humans using such programs. However, why does it appear problematic to distinguish between artworks created by humans and those by AI? Because we still think of art as something primarily visual. AI and human artists' creations may appear indistinguishable. Nevertheless, the question remains there: are they the same?

The question is not entirely new, as the philosopher Arthur C. Danto faced the same problem in the last century. In his article "The Artworld" (1964), the concern regarding indiscernible objects is already evident. Although his subsequent art paper was published almost twenty years later, during an examination on the Archives of Arthur Danto at Columbia University, I observed that his reflection on this topic is also present in a manuscript from 1974,[1] which would later form the core of *Transfiguration of the Commonplace* (1981).

In this 1981 work there are many examples of indiscernible objects. As a matter of fact, Danto opens the book explaining nine red squares with the same appearance (Goehr 2022). However, the most iconic example in the book are Warhol's *Brillo Boxes*. This piece challenged the art world by presenting a perfect replica of a real object, emphasizing that external resemblance alone does not define art. This led Danto to define the necessary conditions for something to be considered an artwork. He established a definition of art that could significantly contribute to the ongoing debate on whether artificial intelligence can create art. This article will examine Danto's theory of art and use it to clarify some crucial issues of the present debate, as follows: first, it will present his definition of art; second, it will explore the question of intentionality following a discussion on creativity and the possibility that AI might develop a style. Third, it will examine the problem of how to interpret works of art. Finally, it will discuss whether AI productions can be called "art."

[1] "Proto Theory of Art." Manuscript located in the "Arthur Coleman Danto manuscripts, 1958-2011," University of Columbia Archives. I thank the Librarians of Columbia University Archives for their work and nicety when I worked there.

1. Appearance and the Definition of Art

In studying the *Brillo Boxes*, Danto considered that Andy Warhol invalidated the theory of mere perception since he displayed packages indiscernible from the everyday objects they imitated. This piece, which he first saw in 1964 at an exhibition at the Stable Gallery on East 74th Street in New York, strongly affected him. Indeed, it catalyzed his first theoretical foray into the artworld (Danto 2001, 378). Danto considered the problem of indiscernibility a philosophical touchstone from which many different issues could be addressed.

In the same way, Danto believed that Warhol's work manifests the essence of art because it sets us in the position to distinguish it from reality. Danto considered the difference between art and reality the essence of art. For this reason, the definition of art also needed to account for this distinction. After that, the question no longer consists of what art is but instead of why, of these two indiscernibly different objects, one is a work of art and the other is not. Although Danto fought the approach of "visual theory" in his first article in 1964, he did not offer a genuine alternative until his book *The Transfiguration of the Commonplace*, where he defined art.

Danto's definition of art contains two necessary (but not sufficient) conditions: art has to have meaning, and this meaning has to be embodied. The first condition for something to be art is "to be about something." Aboutness refers to having a theme or a meaning. With this first condition, Danto highlights the semantic nature of art (Cascales 2022, 126-128). Ordinary objects or elements in nature exist, and we do not wonder what they mean, while for works of art, it is essential to formulate what they mean. This significant condition of art is not an accessory part of the definition but original since, as the author says, "a work of art's being is its meaning" (Danto 2001, x).

Art involves the embodiment of meaning. The incarnation of meaning is the second necessary condition. It reveals that referentiality is not a mere description or allusion to something else but rather a particular way of talking about something. This meaning is usually embodied in a work of art's materiality and typically projects a point of view. With this, it is essential to emphasize that meaning is not captured once the work has been "explained" (or the explanatory text at an exhibition read) but is embodied in the work itself.

What is the artwork's content like, and how can the viewer capture it? Danto develops this question by analyzing the metaphorical structure of artworks, which he sees as symbols or vehicles of ideas that we always en-

counter sensibly configured with a particular form. Put in Dantian terminology, they are embodied symbols. Works of art are not just characterized by having meaning, since objects that are not works of art also possess this characteristic. Art is the embodiment of that meaning. Embodied meaning is, therefore, the result of unity between the object and its context. They are not just related in that one came after the other; instead, embodiment is essential for meaning.

The human mind intervenes in creating meaning and choosing how to embody and shape this meaning. Embodiment is essential and can change the interpretation completely. At the same time, embodying the meaning enables the spectator's interpretation.

In creations generated by artificial intelligence, one must wonder whether the algorithm or the person setting the program introduces the meaning. In this sense, we can compare it to photography. At the beginning of photography, people thought that art died because machines could make perfect reality recreations. However, currently, we understand that a photographer is necessary if we were to have a piece of art. Many cameras record and take pictures all the time (surveillance cameras in public, satellites, etc.); however, we do not consider those recordings as art. This comparison brings us to a new point: the question of the intention. To be art, is it necessary for a piece to be created with intention?

2. The Question of Intention

Danto tried to offer a theory to distinguish artworks from mere things. The stablished theory in philosophy of Art, then supported by Neowittgenstenian philosophers, assumed that it was enough just looking to determine what art is. However, Danto thought the definition had to lie elsewhere as according to that theory, it was impossible to distinguish between Andy Warhol's *Brillo Box* and the authentic Brillo Box.

What do we have to consider to understand something as art? It is not easy to know the intention of the artist, mainly because we engage with the artwork itself rather than the artist. Also, some authors argue it is difficult to discern anyone's intention, which shows that they understand "intention" solely as a psychological aspect.

This thesis was proposed by Monroe Beardsley and called the "intentional fallacy" (1992). Beardsley argues that reference to the artist's intentions is irrelevant to interpreting a work of art (Lyas and Stecker 2009, 369) because a work is a public object open to objective examination, while an intention

remains a private matter within the artist's mind. Therefore, the intention, besides being impossible to know, is irrelevant because the work is an independent object. As a result, interpretation, regarded as the identification of meaning, becomes a public matter limited by the use of linguistic rules and public data about the author.

These assumptions can be answered. Firstly, if the intention is a private mental matter, we cannot know the object of any mind. However, we often infer the mental states of others through their manifestations in actions and their products. To the extent that a work results from the artist's intentions, it is possible to identify it as the result of his action (Danto 1981).

In that same vein, Danto asserted in the opening of *The Transfiguration of the Commonplace*, "the difference between a basic action and a mere bodily movement is paralleled in many ways by the differences between an artwork and mere thing" (1981, 5). Although Danto supported the "basic actions" theory, he cited Wittgenstein and Anscombe, particularly her renowned essay "Intention." In this book, Anscombe explained how actions are configured by intention. Essentially, our bodily movements are often purposeful, each individual capable of explaining the underlying reasons. We cannot say: "I didn't shoot; it was just that my fingers moved." There exist movements devoid of intentions, such as tics or spasms, but in these cases, we do not call them "actions," and we usually do not judge them morally.

Also, people know how to interpret movements in different situations. In this sense, Anscombe argues that intention is not only psychologically private but something we can suppose through people's external actions. Wittgenstein prefers to talk about how actions fall under rules that allow observers to understand.

Therefore, if all this holds true, artists indeed have intentions when creating artworks. They harbor a content, a meaning, a sentiment they aim to express, to channel through their art: "An action and an artwork then would be differentiated by their respective orders of mental causes and by the further differences between conforming to an intention and expressing a feeling" (Danto 1981, 6).

The meanings of artworks are often not entirely transparent but are more accessible than "opaque." In this regard, deciphering the meaning implies referring to the communicative intention expressed and how the expression was made (Margolis 1979, 452). Therefore, identifying intentional properties is a matter of the meaning of the work, established through particular conditions of identification and interpretation.

Furthermore, the debate with Beardsley underscores the challenge of relying on a purely psychological notion of artistic intentions to analyze these elements. It becomes imperative to adopt a semantic approach to the relationship between the work and the artist and, with it, to the intentional properties.

Danto asserts that a work of art is a meaningfully constructed entity. This notion implies that it is an entity characterized by physical properties that convey significant (intentional) properties, such as representation or expression of something. Hence, the possibility of distinguishing between a mere physical object and a work of art arises from the relationship between perception and interpretation. Only then it would make sense to adopt a semantic approach in which the meaning of the work becomes relevant when referring to works of art.

3. Can AI Have a Personal Style?

In his writings on intention, Danto often discusses style as a means to express different meanings. Danto derives his style concept from Frege's concept of *Färbung*, which refers to coloring (Danto 1981, 163). Nevertheless, as Fontaine points out, Danto used that concept relation to sense, allowing it to bring cognitive import to subjective associations (2022, 26-32). Style encompasses the artists' way of conveying intentions and expressing their uniqueness and creativity. Each artist develops a personal style reflected in their choice of techniques, colors, shapes, and themes. Thus, it is possible to see how personal creativity operates and how every point of view has something different to say. According to Danto, each artist brings a unique intention to their artwork, guiding its interpretation and relationship to the world. Each artistic viewpoint provides a different world perspective, communicating something unique through its style. This notion underscores the idea that creativity in art is a personal and subjective process in which each artist brings forth their unique vision within a specific historical moment.

In artificial intelligence, success hinges on meticulous data analysis and adherence to established rules, while creativity taps into the limitless realms of human imagination, fostering novel ideas that defy norms. AI thrives in structured, data-driven tasks. However, creativity's enigmatic terrain, shaped by diverse experiences, propels us to break free from convention and ask audacious "what if" questions—a uniquely human domain. As Anantrasirichai and Bull have shown, while "AI accomplishments rely heavily on data conformity, creativity often exploits the human imagination to drive original ideas that may not follow general rules" (2022, 590).

In this connection, in the chapter "Narrative and Style" in *Beyond the Brillo Box*, art styles and practices refer to each other, generating their own world (1992). Thus, for example, Warhol's pop art style is not understood without considering the artistic context at the time when abstract expressionism triumphed. One of the most exciting ways to understand how Danto traces the system of internal relations that works of art establish among themselves, regardless of the place or time they were created, is by addressing the historical relevance of an artistic style once it has emerged as an integral part of the history of art. In effect, stylistic genres are constituted independently of the works that impelled their emergence. They can even be used to catalog an artist as belonging to a particular style without the artist knowing that this work will someday be integrated into a stylistically determined genre.

Accordingly, Danto believed that a greater variety of styles and practices results in a richer artworld: "The greater the variety of artistically relevant predicates, the more complex the individual members of the artworld become; and the more one knows of the entire population of the artworld, the richer one's experience with any of its members." (1964, 583-584). As we can see, the Dantian approach to style helps us understand that art is not just something an artist does but a complex framework of intentions and historical development.[2]

AI is proficient in performing various tasks, such as classification, object detection, similarity retrieval, and multimodal representations (Cetinic and She 2022). All these abilities allow AI to emulate requested artistic styles with precision. It can even compose previously unwritten sonatas in the likeness of deceased composers. However, it is a reduction to call these abilities creativity, and it is a mistake to call the result of this activity art, no matter how astounding the results are.

Instead, AI models, such as DALL·E 3, Stable Diffusion, or Midjourney, derive their creative abilities from extensive and diverse datasets. The effectiveness of AI systems hinges on their computational architecture, learning strategy, and the data they use for training (Russell and Norvig, 2020). These models exhibit specific combinatorial properties, with their performance typically mirroring the quantity and quality of the data on which they were trained. Consequently, AI models excel in recreating widely recognized artis-

[2] Noël Carroll also comments on the topic in his chapter "Danto, Style and Intention" (2021). For him, the style is not only a question of interpreting the piece, as he said, "Often we are interested in stylistic features for purposes other than interpretation" (Carroll 2021, 30).

tic styles—such as the expressive works of Van Gogh—where the dataset is extensive and rich in examples. However, they face challenges when reproducing more obscure or lesser-known artistic styles. In essence, AI effectiveness depends on the quality and appropriateness of training data, as it is through these data that AI systems learn to make informed decisions and produce accurate results when deployed in real-world scenarios (Anantrasirichai and Bull 2022, 635). Besides, the consideration that AI models produce already widely acknowledged and popular styles is also interesting in itself. This production raises the question of whether these models inadvertently contribute to the perpetuation of well-established artists and styles, potentially overshadowing and hindering the dissemination of lesser-known or emerging artists.

Furthermore, AI lacks the initiative or intrinsic motivation to pioneer entirely new artistic styles. Instead, it relies on human input to combine or adapt existing styles. These dynamics highlight the symbiotic relationship between AI and human creativity, wherein AI serves as a tool to amplify and reinterpret established artistic conventions. However, the overarching question remains: can AI ever truly generate art that is original and independent of human influence, or is it fundamentally bound by the algorithms and data from which it derives its creative capabilities?

In a lucid 2010 interview, computer art pioneer Frieder Nake defended that computer art has no masterpieces because computer art is not about producing "pieces." It is about the production of system designs and the beauty and coherence of these designs. In other words, as Offert pointed out in another article, "it is the method, not the artifact, that is relevant for the aesthetic judgment of a work" (2019).

4. The Problem of Interpretation. What does it mean to interpret?

According to Danto's theory, artistic interpretation is an intellectual operation through which an object in the everyday world is elevated to the category of "artistic object". The interpretation is ontologically constitutive: "An object o is then an artwork only under an interpretation I, where I is a sort of function that transfigures o into a work: I (o) = W" (Danto 1981, 125).

In this light, if everything depends on interpretation, we can theoretically interpret something created by a machine as art. However, our interpretation is based on a concept of art (embodied meaning) and within this concept, there needs to be someone who imbued that meaning into the artwork with an intention. When there is no human agent behind the intention, as is

the case with a machine, we tend to extrapolate, assumen, and project human-like intention onto the program, despite its lack of actual intentionality. Hence, the critical distinction lies in attributing human-like characteristics to AI programs: either imagining that they operate similarly to us during the "creative" process or, more problematically, presuming that human beings operate identically to AI program.[3]

Art is significant only if there are humans who can interpret it as art. Consequently, art exists only when interpreted as such. This means artworks can also be subject to misunderstanding or destruction. It is the spectator who carries out this transfiguration through interpretation, yet we should remember that such interpretation would not be possible without the artist's creation or configuration. For this reason, to understand interpretation properly, it is crucial to keep in mind the intrinsic relationship between the artist's process and the viewer's interpretation. The spectator's task is to identify the aboutness, capture the artwork's metaphor, and give life to the work. In turn, the work has a semantic dimension that must be interpreted, providing a hermeneutical dimension. In this sense, an artwork can only be considered alive when interpreted.

Thus, interpretation constitutes the work, yet, in turn, is determined by the artist's intended meaning. That is why an artist's intentional manipulation of an everyday object can produce the transfiguration of the object into a work of art. This process includes a transfiguration of the object and provides an ontological coating that gives the object a new identity. As Danto notes,

> My theory of interpretation is instead constitutive, for an object is an artwork at all, only in relation to an interpretation. […] Interpretation in my sense is transfigurative. It transforms objects into works of art and depends upon the "is" of artistic identification. […] If interpretations are what constitute works, there are no works without them, and works are misconstituted when interpretation is wrong (1986, 44-45).

[3] Recent studies have shown that aesthetic judgements of abstract artworks differ when attributed to humans or robots. Mikalonytė and Kneer (2022) demonstrated that people judge robot paintings and human paintings as art to roughly the same extent. However, people are much less willing to consider robots as artists than humans, which is partially explained by the fact that they are less disposed to attribute artistic intentions to robots. On the other hand, Di Dio, Ardizzi, Schieppati, Massaro, Gilli, Gallese, & Marchetti (2023) illustrated how human-authored paintings received higher ratings when attributed to humans, while robot-authored paintings received lower ratings on beauty when viewers knew the authorship, suggesting resistance to accepting AI in art creation and underscoring the emotional aspect of human artistry.

Of course, these words do not imply that an artwork can only have a single interpretation. While multiple interpretations are conceivable, not all are valid. Both the artwork and its interpretation are inscribed in the artworld. Our historical awareness and knowledge of art history influence how we interpret art, whether it is actual or ancient. Therefore, not all possible interpretations hold true in the context of art.

Danto assigns a role to interpretation that places the weight of art's constitution on the spectator. This idea is one of contemporary art's essential characteristics, which Danto's philosophy of art insightfully includes, explains, and defends. Since, as mentioned, the meaning of a work of art is not transparent to human perception, the viewer must set in motion an intellectual process to identify the work as such. Along the way, the artworld has developed certain conventions that permit distancing art from reality, making it easier for the viewer to consider what is in front of him as a piece of art. As Danto himself perceives, these conventions have been developed in all the arts: a frame delimits the borders of the painting, the pedestal delimits a sculpture, and the stage and backdrop constitute a theater.

However, since contemporary art has broken these conventions, distinguishing art from reality is now more challenging. For this reason, Danto warns us that identifying artwork means seeing the artistic object (which will sometimes be an unmodified, real object) endowed with a meaning that other objects lack. Everyday objects are produced for something, but they are not about anything. In contrast, a work of art has a built-in meaning that gives it a different ontological status. As he says, to see something as a work of art is to go from mere things to the realm of meaning.

This question does not involve everyone assigning the artwork a meaning or that meaning is made up. It is, instead, about trying to discover its meaning: "You can call a painting anything you choose, but you cannot interpret it any way you choose, not if the argument holds that the limits of knowledge are the limits of interpretation" (Danto 1981, 131). Indeed, correct interpretation coincides with the artist's intention. Although I think that, at this point, Danto intends to argue that not all interpretations are valid and that correct ones consider the artist's intention, it is also true that the historical perspective highlights nuances that the artist could not have foreseen.

Margolis rightly questions the implication that artwork does not exist if the artist's intention remains unknown (Margolis 2008, 85-86) and how we can know that intention. This discussion about intentionalism and psychologism was already brewing when Carroll criticized it in a previous article. Intentionalism is an approach that gives great weight to the artist's psycho-

logical intentions and holds that, in some way, the artist's "intention" is externally stamped on the artwork. This view involves understanding the artwork as a substance to which external elements are added, making it a work of art. However, the artwork is not constituted as such; the artistic intention is constitutive and imprinted throughout the creative process.

Externalist considerations problematize the question of interpretation. From the externalist and mentalist perspectives, explaining artistic intentionality is impossible. Faced with this consideration, the concept of intentionality is worth clarifying. We certainly cannot know the artist's mental reflections, but intentions that manifest themselves both publicly and in the work itself guide interpretation. Intentional elements have to be inferred from intentional structures and attributes within works of art, which are now seen as public objects, to escape from solipsism in art philosophy. Thus, the problem of knowing the artist's intention is solved when we rid ourselves of psychological determinations and consider that it is possible to know, at least to a certain extent, the artist's intentions.

In conclusion, AI is not creating art. When we perceive the machines as creating "art" we ascribe to them interiority, intention, and creativity to embody meanings in the same way we assume that people in films live authentically. Although AI has demonstrated remarkable capabilities traditionally considered artistic, defining creativity involves producing original and imaginative ideas, often requiring human intuition, experience, and an audience's understanding.

Concluding remarks

Looking to the future, AI's role in creative endeavors will continue to evolve. While AI can replicate existing styles and generate content based on predefined patterns, achieving true artistic innovation remains a significant challenge. This article illustrates how Arthur C. Danto's philosophy of art, while conceived before the proliferation of artificial intelligence (AI) in artistic creation, offers valuable insights for interpreting AI-generated productions.

Danto's emphasis on the role of context in understanding art gains renewed relevance in the context of AI-generated art. AI produced artworks are shaped by data and algorithms, raising questions about intention. As AI lacks intentionality, spectators often anthropomorphize the program, attributing human-like intentions to it. This tendency raises significant issues in discussions about AI-generated art.

The central issue here isn't whether AI creations can be termed 'art,' but rather, who should be considered the true 'author' of an AI-generated artwork—the human programmer, the AI model, or both? We do not have any problem understanding that photographs are taken by humans, not by cameras. This controversy reflects a similar dilemma that will be resolved with a deeper understanding of AI's functioning.

In summary, Arthur C. Danto's philosophical framework provides a valuable perspective for examining AI-generated art. As AI continues to shape the artistic landscape, Danto's ideas serve as a thought-provoking foundation for understanding and critiquing the intersection of human and machine creativity. Whether AI represents a continuation or disruption of artistic traditions remains a topic ripe for exploration and debate in the evolving art world.

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Magical Simulacra and Simulating Magic: A Baudrillardian Perspective on the Recognizing and Creating Magic Using Generative Artificial Intelligence

Abstract

This essay focuses on the aesthetic experience of magical arts. The rise of artificial intelligence (AI) as a tool to decipher magic tricks or elaborate new tricks puts spectators and performers into question. While considering the current technical characteristics of neural networks and generative AI, we aim to show the impact of AI on magical arts using Jean Baudrillard's hyperreality theory. Like any other technological innovation, AI poses new challenges to the magical arts.

Keywords

Magic, AI, Performing Art, Baudrillard

Introduction

When Prometheus gave fire to humans, he taught them the two principles of survival in a state of nature: identifying and understanding natural laws and acquiring the art of cunning. These are the foundations of any magic when a magician seemingly breaks physical laws before an amazed public. The public of magic knows very well that the events that seem to happen in front of them are impossible, and this incongruency is the source of the enjoyment derived from magic (Leddington 2016). In this essay, we will call magic the performing art designed to trick spectators into believing the extraordinary feats achieved by a magician.

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From the Westcar papyrus to the card tricks of Harry Lorayne[1] or Juan Tamariz, magic has made spectators suspend their disbelief at the time of a show. But, for a long time, magic seemed to transgress the laws of physics and religion, making it difficult to be perceived as an artistic discipline. Only with the works of Reginald Scot (1584) and J. Prevost (1584) did magic become prestidigitation and was considered an art in its own right. The illusionist became an artist who combined speech, acting, stagecraft, and techniques, with or without apparatus. With Jean-Eugène Robert Houdin, new technologies (at the time, electricity and electromagnetism) integrated magic and contributed to creating new magical effects.

Compared with artistic practices, Artificial Intelligence (AI) is a young technology or even a young science. The name was coined in 1956, although the ambition it expresses goes back to a very ancient search by human beings to reproduce their actions, deductions, reasoning capacities, and all biological behavior. Be it in imaginary form, as the legend of the golem shows, or in mechanical attempts to imitate life, like the digesting duck of Vaucanson, the will to emulate life, especially human will, is not new. With these premises on AI described as an imitation of human behavior in computer form, it is unsurprising to wonder how art, the epitome of human life, will be affected.

As a recent contribution to the field of AI, generative artificial intelligence constitutes a particular approach that produces outputs from massive data sets and an input query (also called prompt) based on techniques defining the most probable sequential elements in a given context. For example, Large Language Models (LLMs) are based on theories published recently in 2017. They generate texts by suggesting the most relevant terms based on context elements. The quantity of content used during the learning phases gives its systems syntactically correct and semantically coherent production capabilities. It is thus possible to ask an LLM to generate a text like a given author or construct texts from incomplete information. The volume of training data ingested and the probabilistic model allows it to display a surprising form of "creativity."

Generative Artificial Intelligences, such as ChatGPT, can also be the origin of that same reality disruption caused by magic in the eye of the public. The similitudes between the discourse surrounding AI and religious discourses have thus been widely addressed in the scientific literature during the last 25 years (Musa Giuliano 2020). For many, tools like DALL.E 2 operate like

[1] Harry Lorayne (1926-2023) was an American magician and author.

a black box to produce endless new creations; the fear is that artists' work will soon be automated. This very fear is in itself a sign that the notions of "genius" or "creation" have not been rejected following Walter Benjamin's essay *The Work of Art in the Age of Mechanical Reproduction* (1935). It is especially true of magic, whose foundations are secret and mysterious. The magician studies them to hide the technique that does the trick. The technique is not so carefully hidden in other art forms, like painting or drawing. The creation of photography and cinema at the end of the 19th century profoundly transformed pictural arts. But magic shows have not been subjected to the same kind of industrialization and still fit the outdated notion of the uniqueness of the work of art.

Often forgotten among the arts, magic is still relatively preserved from the shock of generative AI. Although a century after publication, Benjamin's words are more relevant than ever: "We must expect great innovations to transform the entire technique of the arts, thereby affecting artistic invention itself and perhaps even bringing about an amazing change in our very notion of art" (Benjamin 1935). Since magic has a cognitive component and aims at breaking—at least seemingly—the laws of physics, tools like LLMs are still unable to consider these elements. A magic show is more than a few magic tricks designed to deceive the public. A magic show is a theatrical event based on two elements: the techniques used by the magician and the verbal and nonverbal discourse (music, lightning) surrounding it. This complex combination is destined to create the illusion, the effects the spectator feels, and the perceived magic. Some techniques surrounding cards or mathematical tricks have been published in manuals that "demonstrating the secret of each exercise, […] have borrowed explications so clear and unambiguous that [the reader] will become a swindler by reading [the] compilation" (Anonymous 1863, VI). The will to uncover the secrets behind magic tricks is thus ancient, and the same source advises the reader to protect the secret around prestidigitation by having a sharp tongue and diverting the public's attention (Anonymous 1863, 7). As computers are less vulnerable to such misdirection, we could use algorithms to understand the technique behind the magic. Moreover, as generative AI becomes increasingly common, it could also be used to create new magic shows for spectators to enjoy. AI will then join the potential "arsenal" of a magician, but as with any other artistic discipline, it may transform the aesthetic experience it offers.

This article explores the new challenges posed to magic by the advent of technology capable of decoding and creating magic tricks. Yet, we will argue that AI and magic can be engaged in a complex interaction: our essay will

focus on the impact of AI on the aesthetic experience proposed by a magic show. First, we can wonder if AI can become a new spectator of magic, and then we will explore the potentiality of AI as a magician.

AI as an *emancipated spectator*

According to Walter Benjamin, there are two poles for the reception of the work of art: its cult and exhibition values. With magic, we recognize its cult value in the techniques hidden from the public, and its exhibition value is reflected in its theatrical dimension. The effects lead the spectator to believe they are witnessing events that they deem impossible, and the skilled magician hides the tricks they use. The goal of a magic trick is to make the spectator believe they witnessed something they know is impossible. The audience is, therefore, at the center of a magic show.

Historiography has traditionally found it difficult to analyze the role of the public. The recent apparition of highly engaging and immersive spectacles highlights the importance of a mode of spectatorship that elevates itself almost to coauthor status. It is evident with projects like *Origami for Life*, organized by Belgian designer Charles Kaisin, the Engie foundation, and the Palais de Tokyo in Paris: during the multiple 2020 COVID lockdowns, people were invited to make paper cranes and to mail them to the Palais de Tokyo. Then, starting in January 2021, visitors could admire an installation made of all the cranes received by the contemporary art center that they made themselves during the past year. On the other end of the spectrum of public analysis is Guy Debord's captive audience-consumer, embedded in a society of the spectacle (Debord 1970). This kind of public just passively absorbs whatever media is fed to them by a capitalist society. The spectator of a magic show stands probably in the middle: they are looking, which is the opposite of acting, and are ignorant of the production conditions of the show. But from this passivity, sometimes participation emerges when the magician directly talks to them or asks them to pick a card, as we can often see in Juan Tamariz's shows. Ultimately, no matter the amount of participation, the spectator of a good magic show will be fooled by the magician's skills.

The recent development of technology enables a machine to "watch" by training a deep neural network to track features in animals or humans, like DeepLabCut, a tool aimed at biologists to track the posture of animals like mice or drosophila (Nath *et al.* 2019). These tools can match the capabilities of humans and become artificial spectators. An artificial spectator may be more difficult to deceive, which is how Regina Zaghi-Lara *et al.* (2019)

trained an artificial neural network to follow a coin in a series of sleight-of-hand coin tricks. The tricks were designed to be purely motor, did not involve any verbal indications, nonverbal cues, special effects, or gimmicks, and were compelling enough to deceive the human eye. A machine does not watch like a human does. It follows each pixel frame by frame without dividing its attention. The machine is about surveillance, not spectacle, and it watches the show "neither in the amphitheater nor on the stage but [as] the Panoptic machine" (Foucault 1977, 217). Therefore, the neural network is a new kind of spectator. With machines, the opposition between watching and knowing disappears, at least partially, because they are way more capable of seeing the conditions of production behind the appearances (Rancière 2007, 2-3). Its vision is superior to human vision; essentially, a spectacle is the epitome of vision (Rancière 2007, 6).

The DeepLabCut neural network can watch the magic trick without being fooled by ordinary human perception bias, but it is not a mere tracking tool: it follows the position of a coin as a magician manipulates it. It follows the coin when visible and can also guess its position when hidden (Zaghi-Lara *et al.* 2019). Not surprisingly, in the study of Regina Zagui-Lara, the neural network is fooled less often than the human spectator, although the study also showed that some of the cognitive tricks used to deceive humans can also be very efficient when it comes to machines. This study enables the researcher to consider human biases that the machine is deprived of. For example, in one of the tricks, the human is influenced by the law of symmetry. Analyzing the art of magic with a neural network proved to be a satisfying tool to estimate what machines learn from humans by underlining what they do not do (Zaghi-Lara *et al.* 2019), but above all, it proves to be quite efficient when it comes to enhancing human perception of what happens during a magic performance. In that sense, AI only reinforces tendencies that scholars already described. AI is not quite a spectator of magic shows but an observer, "one who sees within a prescribed set of possibilities, one who is embedded in a system of conventions and limitations" (Crary 1992, 6). DeepLabCut cannot be fooled by the magician, even when it does not manage to successfully track the coins, because it does not understand the physical realities that make the appearance or disappearance of the coins impossible. In that sense, DeepLabCut is not superior to human eyes since "our eye finds it more comfortable to respond to a given stimulus by reproducing once more an image that it has produced many times before instead of registering what is different and new in an impression" (Nietzsche 1998, 192). And that is precisely how AI functions: it is trained on specific

data sets and then imitates what it was trained on when asked to perform a task. But since AI can see above human biases through broader possibilities, it can narrow down the "hyperreality" of the filmed magic tricks. Hyperreality is a concept identified by Jean Baudrillard to describe the confusion of the mind between reality and its representation (Baudrillard 1981, 1).

The success of magic, as far as it is measurable in terms of signs, resides precisely in this space endangered by the all-encompassing asynchronous perception of neural networks. However, magic cannot be resumed to a dry series of gestures. It is a performing art that includes theatrical and psychological dimensions that a neural network such as the one tested by Regina Zaghi-Lara (2019) cannot grasp all at once.

However, this ability of the AI to be insensitive to specific "weaknesses" of the biological brain (misdirection, visual afterglow) ultimately presents advantages for training the magician, who now has an extremely difficult spectator at his disposal. Not all spectators react identically to the performer's text or action in a magic show. AI allows for simulating a soulless interlocutor, indifferent to technical gestures or the most elaborate speeches.

AI as a sorcerer's assistant

Arts and science have been intertwined for centuries now. As Paul Valéry (1934, 191) showed, the act of painting was a supreme demonstration of knowledge for an artist like Léonard de Vinci, and he thought it required him to become omniscient. When photography and film were invented, they became almost instantly art too. Therefore, it is not surprising to see art made using AI today. It would be *cliché* to affirm that while magic exploits the weaknesses of the human mind, AI aims to enhance its abilities. However, this fundamental opposition between the art of magic and artificial intelligence technology should not be forgotten. Since neural networks surpass the human mind when recognizing reality and manuals aiming to educate the would-be-magician have existed for more than two centuries, large language models (LLM) could be interrogated to generate new magic tricks. Of course, the success of a magic trick also depends on the theatrical performance of the magician, but could AI invent new tricks and techniques? A few queries on ChatGPT or LLaMa 2 (on HuggingChat) show that LLMs do not consider the physical reality of the tricks and describe magic tricks like an innocent spectator could perceive without going into the actual trick part. A possible explanation would be the lack of magical literature in the training corpora of these LLMs.

The LLMs can also not recognize a magic trick described by the user: most magic tricks are based on a prop or a unique effect that gives them their names, such as the "Chinese linking rings." If a user describes a trick to ChatGPT or LLaMa 2 and asks the AI to name it, the LLM will invent an answer but cannot effectively recognize the trick. The knowledge about magic is carefully preserved by magicians who try to keep it secret, although magic books have been published for centuries, and more recently, with social media, many tutorial videos are posted online. The culture of secret, though, explains why the knowledge about magic has not been classified and organized like other arts: descriptions are scarce. The classification of magical knowledge is even less advanced, and while a few different taxonomies have been proposed, none were widely accepted (Rensink, Kuhn 2015). The very classification as magic is blurry: it encompasses the magic tricks we focus on in this essay but can also include alleged paranormal phenomena. The inner classification of magic is, therefore, even more blurry. Some suggested an ordering by techniques, others by psychological effects. That is why the LLMs cannot correctly recognize and name the magic tricks a user describes.

While the recognition or the complete creation of magic tricks seem to be challenges that LLMs cannot solve, AI could be used to optimize existing magic tricks to maximize spectators' enjoyment. Howard Williams and Peter W. McOwan (2014, 1283) designed a framework in that sense in 2014 that could evaluate and design new magic tricks originating from existing ones. This framework was based on probabilities to maximize the impact on the public and could also be adapted to specific tricks based on cards. While not entirely creators, algorithms proved themselves valuable assistants in designing new magic tricks, resulting in a jigsaw and a phone app. Their sales then measured their efficiency in a well-known London magic shop: the postulates being that a reputable magic shop would not integrate low-quality tricks into its catalog and that direct sales to magicians could provide insight into the success of the tricks to their target audience (Williams and McOwan 2014). In that experiment, though, the machines here did not invent entirely new magic tricks but analyzed and tweaked existing ones to maximize their success, as measured by the enjoyment of their public. Its efficiency resides in its ability to perform complex analysis at a speed that is unattained by humans. This capability led the authors to question the notion of creativity in a subsequent article published in 2016 to show that this exploratory work generates new ideas by exploring structured conceptual spaces (Boden 1998), is indeed creative, and should not be discarded as a mere stochastic process. More recent works on artificial creativity showed,

with compelling evidence, that artworks created by AI were recognized, at least in terms of monetary value (Tigre Moura *et al.* 2023).

These limitations of generative AI when creating new magic tricks can be linked to a poor training corpus. Generative AI, when asked to produce visual representations of magicians, shows poor iconography, mostly revolving around top hats, cards, and white rabbits. The lack of a culture of magic is showing and most probably devolves from insufficient content in the training corpus. Therefore, it is safe to say that AI is not "the generation by models of a real without origin or reality" and is not a hyperreal, even though we showed it could narrow the hyperreality in which magic happens (Baudrillard 1981, 1). AI thus modifies the interaction between consciousness and the magic performance.

Tigre Moura *et al.* also point out the obvious: very few works of art are entirely artificially created. Most often, there are human interventions, and it would be more accurate to discuss the co-creation of works of art and their quality. This distinction also supports our argument: based on a simple and short prompt, an LLM fails to create a new magic trick. Nevertheless, with more complex algorithms that consider human feedback, it is possible to artificially co-create new magic performances by optimizing older ones.

Conclusion

Artificial Intelligence is based on "the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it" (McCarthy, Minsky, Rochester, and Shannon 1955). It attempts to reproduce artistic performances. Generative AIs are, therefore, those that have the most striking impact on art of any kind. It is then indisputable that technological improvements will transform how a work is produced and even how the public will perceive it. The world of magical arts is not immune to these transformations.

Several tendencies finally emerge from the confrontation between magical arts and artificial intelligence. First, as the public perceives, at least momentarily, AI as a "magical" and sometimes incomprehensible mechanism, artists can invoke Artificial Intelligence as a kind of assistant capable of helping them guess a card chosen by a spectator or make a prediction. Romain Lalire, a French magician, is already exploiting this path. Like any other heavily discussed technological innovation, AI can be used as a prop in a show. AI can also be an impartial "coach" to practice magic. The "insensitivity" of AI to specific conjuring techniques forces the magician to consider several be-

havioral approaches and variants in their practice. In *Sleights of Mind* (Macknik *et al.* 2010), the authors point to the cognitive differences of human viewers who can react differently to the same trick. An AI can help a magician progress in their practice. However, some limitations of AI in its perception of the physical world forbid it to be systematically more efficient than a human. Finally, the magician artist may consider leveraging AI to create parts of their show. For example, music can be designed using AI with perfect synchronization between highlights, weaknesses, and the climax of a turn. Gradually, based on adapted training, multimodal AIs can produce ideas for magic tricks or suggestions for accompanying texts.

Unlike other arts, the dangers that AI can pose to the magical arts seem less critical. Most importantly, because the secrecy surrounding the world of magic limits the training data available, even if many accessible books and videos violate it, these contents are in small quantity compared to musical works, paintings, plays, poems, *etc*. Secondly, as David Devant points out in *Secrets of my Magic* (1936, 54), this secret character makes this art "less popular than the arts more comprehensible [...] because the main support of any art is the amateurs" who practice it. The magical arts constitute a small world, ultimately a form of protection against mechanization.

In the end, the real danger that AI embodies would be to enable a magician to perform the perfect illusion, especially with the performance of virtual magic tricks. With the words of Baudrillard, we can affirm that "virtuality tends to the perfect illusion [...] it is a "re-creative" (and re-creative) illusion, realistic, mimetic, hologrammatic. It ends the illusion with the perfection of the imitation, of the virtual re-edition of the real" (Baudrillard 1997, 61-62). With its complex relationship to the notions, ever so relevant, of hyperreality and hyperreal, AI transforms the aesthetic experience of the magical arts for both the spectator and the performer.

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On the Legitimacy of AI-Generated Art: Exploring the Aspects of Creativity, Mediality and Human Agency

Abstract

Artificial Intelligence (AI) has revolutionized diverse fields, including art, raising questions about the authenticity and value of AI-generated artworks. This essay explores the legitimacy of AI art, examining whether these creations qualify as genuine art and how they integrate into the broader art historical context. It scrutinizes the theoretical debates surrounding the incorporation of AI applications in artistic creation, emphasizing the importance of understanding the creation and reception processes in evaluating the legitimacy of AI art.

Keywords

AI-Generated Art, Computational Creativity, Mediality, Agency, Authorship

Introduction

Artificial Intelligence (AI) has seamlessly integrated itself into various facets of scientific research and technological advancement, making substantial contributions across numerous fields. In biomedicine, algorithms like SISH have emerged as potent tools, functioning as a pathology image search engine with profound implications for detecting rare diseases (Chen *et al.* 2022). Meanwhile, in astronomy, the Deep Density Displacement Model, a neural network, delves into predicting the nonlinear structure of the Universe, propelling the frontiers of our cosmic comprehension (He *et al.* 2019). The pervasive influence of AI extends far beyond, leaving its imprint on

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chemistry, geography, meteorology, and an extensive array of other fields, permeating our daily lives and molding the contours of the global landscape. From revolutionizing self-driving cars and shaping marketing strategies to optimizing search engines and influencing judicial decisions, AI's omnipresence manifests in numerous facets, including gaming, weather forecasting, digital assistants (e.g., Alexa or Siri), image recognition, spam filtering, flight delay predictions, and targeted online advertising.

As AI techniques evolve, it unfolds new realms of creativity and interpretation that captivate artists, drawing them towards the possibilities presented by AI mediums. The burgeoning significance of AI applications in art is not merely a transient trend; it has become an inescapable and irreversible aspect of today's world. Consequently, this phenomenon demands attention from both art theorists and individual artists. While scientific endeavors predominantly emphasize practical outcomes that contribute to research and technological progress, artists exploring AI applications showcase distinctive inclinations, unveiling the transformative potential of AI in the realm of creativity.

Examples from AI-generated art

The interplay between AI and the arts is not recent, as history reveals an indirect but notable interaction between the two. One common avenue for integrating AI into artistic practice can be described as "repetition" or the recreation of historical artistic styles and forms. An illustrative case is *The Next Rembrandt* (2016), a 3D-printed painting crafted exclusively from data derived from Rembrandt's body of work. This remarkable piece emerged through applying deep learning algorithms and facial recognition techniques, involving 20 data scientists, developers, AI experts, and 3D printing specialists over 18 months of collaboration. The project began with an exhaustive analysis of Rembrandt's extensive collection, resulting in a database exceeding 150GB. Neural network algorithms enhance painting resolution and image quality, mainly restoring damaged artworks. Another noteworthy example involves the reimagining of portrait styles through algorithms. In late 2018, Christie's auction house made history by selling *Edmond de Belamy*, the first AI-generated portrait, created by the artist collective "Obvious," which sparked considerable controversy as it fetched an astounding $432,500 at auction (Epstein *et al.* 2020, 1). This artwork, generated using General Adversarial Networks (GANs), brought on debates about authorship and the role of AI in the creative process. While the algorithm autonomously

generated the final image, the initial input and design choices were guided by human artists. The intersection between human intent and AI autonomy in the creation of *Edmond de Belamy* exemplifies the delicate balance artists must strike when integrating AI into their practice. Subsequently, with the advent of programs like *Midjourney* and *DALL.E 2*, these techniques have become increasingly accessible to a broader audience.

AI's influence extends beyond visual arts and permeates the realm of music. From probabilistic to rule-based approaches in computer music in the 1960s and 1970s to AI-driven harmonization techniques, AI has left its mark on musical composition (López de Mántaras 2017, 104-116). In 2016, Sony researchers harnessed Flow Machines Software to analyze a global database of over 13,000 lead sheets from various music genres, ultimately autonomously composing a pop song titled *Daddy's Car*. Furthermore, AI's presence extends into the realm of contemporary art through the embodiment of robotic artists. Aidan Meller, a curator from England, collaborated with engineers at Engineered Arts to create the world's first "AI ultra-realistic robot artist," AI-DA. This humanoid artist, equipped with a microchip in her eye and a pencil in her hand, creates art through sight and actively engages in performance art, interacting with audiences during exhibitions.

In addition to such "autonomous" productions (McCormack *et al.* 2019, 5-7), where human creators often tend to take a backseat, there is a spectrum of artworks produced and performed through direct cooperation and co-creation with AI. For instance, on November 22, 2017, renowned dancer Kaiji Moriyama captivated audiences by playing the piano without touching its keys. He achieved this feat by dancing across the stage with sensors that translated his movements into piano sounds. Susie Fu's *Artist and Machine* series, from 2018 to 2020, provides another example of the collaborative relationship between artist and machine. In this performance series, Fu and a machine draw alongside each other, with machine learning to draw like the artist and striving to improve after each performance.

Legitimacy Problem of the AI-generated Art

These examples underscore the multifaceted ways AI has integrated into art, spanning various forms, degrees, and functions of applications, integration, or cooperation with artists. Whether through algorithms, GANs, or intricate humanoid robots like AI-DA, AI seems poised to become a substantial part of artistic production rather than merely serving as a tool or instrument. Moreover, they posit that artists successfully interacting with AI demarcates the

lines between the traditional roles of creator and creation. Therefore, the central question regarding the legitimacy of AI-generated art as art requires investigation: Can AI-generated or AI-assisted works genuinely be considered art, and how do we decipher the aesthetic contributions of a non-human element, AI, in creating a vast array of artworks?

This debate surrounding the legitimacy of AI art as art revolves around several key issues. Firstly, there is a historical challenge: when has the incorporation of AI into the arts historically become problematic? The trajectory from rudimentary forms of computational creativity in the 1950s, with limited self-creation capabilities that posed no threat to the arts, to modern image-generation programs based on GANs complicates the determination of the beginning of AI's legitimacy in the arts. Secondly, the authorship question is intricately tied to the legitimacy of AI art. In AI-generated art, where a substantial portion of the work is generated by AI techniques, surpassing the artist's intent and vision, authorship becomes ambiguous. Who should be credited as the author—the algorithm, the artist, both in collaboration, or others such as program developers (Epstein *et al.* 2020, 1-10)? Lastly, the third issue pertains to pessimism regarding the future of the arts. Does AI positively impact the arts, enhancing aesthetic creativity, or does its omnipresence in the artistic sphere inevitably lead to a loss of aesthetic agency and the potential decline of traditional artistic practices? These questions form the crux of the ongoing discourse, challenging our understanding of AI's role in shaping the future of artistic expression.

The answers to these questions fundamentally hinge on one's foundational understanding of art and its principles. Subsequently, this debate has cleaved the discourse on aesthetics into two opposing camps. Proponents of AI art staunchly affirm the validity of aesthetically valuable compositions produced through computational creativity (López de Mántaras 2020; Mazzone *et al.* 2019). They contend that AI-generated art possesses genuine artistic value and can be considered a legitimate form of art (López de Mántaras 2020, 101). Proponents highlight the unique ways AI algorithms generate novel patterns, styles, and compositions, challenging traditional notions of art.

In contrast, critics of AI art cast doubt on the possibility of creating valuable artworks solely through algorithms or computer programming (Mersch 2020; Stephensen 2022). They express concerns about the implications of AI for human creativity, the essence of art, and the art world's future. Critics argue that AI lacks a genuine understanding of the human condition and that its creations are mere imitations or repetitions of existing styles, devoid of true innovation or personal expression (Mersch 2019, 65).

Computational Creativity and Production-based Legitimation of AI Art

This essay posits that the debates surrounding the legitimacy of AI-generated art arise from a lack of consensus in the aesthetic discourse regarding fundamental concepts such as creativity, novelty, and human agency, particularly with AI-generated art. Advocates for AI art celebrate its computational creativity, challenging the notion that creativity exclusively resides in the human, non-artificial, and natural realms. Computational creativity, centered around replicating human creativity in AI, aims to generate new and original ideas, challenging the belief that creativity is confined to human and non-artificial domains (Arielli *et al.* 2022, 4-9). This perspective suggests the co-existence and interchangeability of these forms of creativity, especially in artistic creation, asserting that AI-generated art holds genuine artistic value and qualifies as a legitimate art form. However, this paper argues that the central issues revolve around conceptual misunderstandings about creativity, novelty, and assumptions about the nature of art. While nuanced perspectives exist, recognizing both the potential and limitations of AI art compared to human-created art, the problem lies in the unfounded division of creativity into natural and artificial categories (Zylinska 2020, 23-27). Consequently, AI-generated art is evaluated based on its creative prowess, regardless of whether it emanates from human or machine sources.

The assessment of AI-generated art based solely on its creative merits raises a crucial question: should creativity alone serve as the exclusive criterion for determining authentic artistic practice? The essay proposes that, while undeniably crucial, creativity should not stand as the sole determinant of genuine artistic practice. As AI art evolves, generating new forms of expression, the discourse on its legitimacy remains dynamic within the broader context of aesthetics and art theory. To address questions of legitimacy, one should rethink and reevaluate fundamental concepts within the discourse on emerging AI aesthetics, particularly emphasizing the need for a clear definition of "aesthetic creativity" (in contrast to computational creativity) that enables AI applications to enrich aesthetics and human experiences. The critical inquiry into the role of different uses and functions of creativity challenges, at the same time, the presupposition that the definition of art aligns with "novelty," and it explores the interconnected assumptions surrounding computational creativity in the arts (Elgammal, 2019). While moments of the unknown, unpredictability, and novelty are valued in contemporary aesthetics, not every entirely new, unknown, or unpredictable production can automatically be recognized as art.

Understanding the Medium of AI Art

When the preceding discourse highlights the term "creativity," it tends to focus on the production facet of algorithmic aesthetic application when evaluating the legitimacy of AI art. Consequently, the discourse on AI art often neglects the broader social, cultural, historical, and contemporary (digital) context within which AI operates. Contrary to this production-centric viewpoint, this essay asserts that no form of art, including AI art, exists in isolation from human intervention and participation. On one side, aligning with proponents of AI art, it is crucial to recognize AI as a novel and potentially valuable medium for the arts when applied judiciously. AI transcends its role as a mere tool, offering unique qualities absent in traditional artistic media. The autonomous nature of AI mechanisms opens avenues for new dialogues and enriches the creative process in aesthetic practices. For example, Anna Ridler's Bloemenveiling (2019) stands as a testament to the potential of AI art as a collaborative practice between artists and algorithms, showcasing the significant role GAN models play in artistic expression.

Conversely, in alignment with concerns expressed by critics of AI art, it should be stressed that not every AI-generated artifact automatically constitutes valuable or novel artistic practice (Boden 2011, 164-174). The legitimacy of AI art extends beyond the computational production processes of AI mediums; instead, it encompasses fundamental aspects of human beings such as intention, reception, and reflection. This nuanced perspective recognizes that while AI can enhance creativity within the production process, not all AI-generated artifacts can be automatically deemed valuable or novel artistic practice because their legitimation as art requires the medial relation between the processes of production and perception.

Even in its most productive use as a medium, AI and AI-generated art cannot disassociate the realm of human intervention and participation. The blurred boundary between artificial and non-artificial intelligence implies a seamless connection between the medium of AI and ourselves. The co-existence of production and perception is a prerequisite for social, epistemic, and aesthetic practices. In this context, Böhme and Matussek define aesthetic practice by referring to the Aristotelian concept of "metaxy" (Böhme *et al.* 2008, 98-101). Metaxy means a specific practice that can only exist as "co-existence" (German: *Ineins-werden*; becoming one and the same) and implies simultaneous production and perception. In other words, the produced works or events, on the one hand, and the subjects experiencing them

aesthetically, on the other hand, do not merely exist for themselves. Instead, a particular artistic practice presupposes the co-existence of the experienced object and the subject who experiences. Because in a particular artistic practice, the production and reception processes are based on their mutual mediation, with none having priority. Finally, artistic practices have their reality only in their mediality.

This basic notion of mediality can be extended with a technology-philosophical approach, as articulated by Hubig (2006, 13), and shed light on the role of AI as a medium in producing art. According to this approach, technology unites human self-world relations with the non-technical world through its medial nature (Hubig 2006, 15). Hubig argues that technology is not merely a human invention; it constitutes individual relationships and even extends to relationships with extra-human life. The concept of mediality, as presented in this approach, is mathematically innumerable and plural, relying not only on diverse uses of materials or media but also on the technical possibilities realized through human practices' open, unbounded structure. Hubig (2006, 148) describes mediality as creating open spaces of possibility, structured to make something possible depending on initial conditions, excluding the impossible both outside and as an alternative option in the interior. In this framework, individual media, algorithms, and codes create open spaces of possibility where fundamental self-references and world references of people are newly established. This concept of mediality lays the foundation for understanding how AI operates as a new medium for art, introducing new possibilities for expression and understanding.

Building upon this, a performative approach to media and mediality, drawing from the works of Sybille Krämer, aids in comprehending AI's role as a novel medium in art. This approach foregrounds the simultaneity of mediation and creation, asserting that the mediated, especially in art, is generated through the act of mediation itself (Krämer 2004, 13-32). It implies that the function of the medium goes beyond making objects perceptible; instead, it involves the actual generation of those objects. Krämers performative approach to mediality aligns closely with the theory of generative art, but with a crucial distinction: creation in this approach inherently depends on primary human conditions like perception, social interaction, and active participation. Krämer (2004, 13) notes the commonality of performativity and mediality in conveying something while simultaneously creating the mediated. Mediation is not a mere transference practice of given codes or values; what is transmitted or mediated gains existence and specific properties through the medial production itself. Therefore, a performative ap-

proach to AI medium, which accentuates the interplay of the fundamental role of mediality for artistic content's generation and reception processes, assumes a significant role in AI-generated art.

The Role of Human Agency in AI-generated Art

In light of the performative approach to mediality, the active role of human agency in engaging with AI mediums becomes evident. While AI systems demonstrate the capacity to generate aesthetically appealing content autonomously, the indispensable role of human agency in shaping, guiding, and contextualizing the output is paramount. Human involvement in AI-generated art is as significant as in traditional art without AI techniques. This engagement spans the entirety of the artistic process, from the pre-creation phase to the social contextualization of artworks.

In the pre-creation phase, humans are pivotal in selecting and training datasets, whether they comprise images, texts, or other forms of input. The second phase involves dynamic feedback loops, where artists and curators engage in an ongoing dialogue with the AI-generated outputs. This continuous exchange prompts evaluation, modification, and refinement of the input, fostering an iterative and collaborative creative process. The third phase extends to the individual reception, critiques, and social contextualization of AI-generated works. Human agency steps into the spotlight, presenting and contextualizing artworks within the broader art world, galleries, or online platforms, thereby imbuing the creations with continuous interpretation and significance.

In essence, while AI can autonomously produce compelling sounds, images, texts, and forms, the legitimacy and recognition of these outputs as artworks depend on the active participation of human agency throughout various stages of the artistic process. Artists, developers, and curators serve as guides, infusing AI-generated art with meaning and providing the context for understanding and appreciation within the expansive realms of culture and art. Simultaneously, the recipient's role in interpreting and engaging with these creations becomes integral to the ongoing dialogue that shapes the evolving landscape of AI-infused artistic expression.

Beyond the described process of AI-generated art lies a compelling reality: the art world cannot afford to disregard the profound changes instigated by the implementation of AI in the human realm. Instead of turning away, art assumes a critical responsibility—to actively contemplate and prompt reflection upon the profound social, economic, and political shifts brought

about by the medium it engages with AI. This reflection involves acknowledging and actively embracing and dissecting the AI medium's implications that trigger these shifts (Papagiannis 2017, 136). The challenges posed by AI in the arts become not just creative obstacles but avenues for the continual expansion of human understanding of evolving relationships with the world.

In this dynamic landscape, the role of artists in reflecting upon the social, economic, and political shifts driven by AI becomes inherently demanding. It extends beyond the aesthetic sphere, urging artists to delve into the complexities of these changes and illuminate the nuances through their creative work. The intervention of AI in the arts contributes not only to the expansion of artistic boundaries but, conversely, compels artists to challenge the limits of computational thinking and creation within the context of artistic expression. This reciprocal relationship between AI and artists becomes a dynamic force, shaping technological and artistic evolution trajectories.

New Possibilities by AI-generated Art

In recognizing the vital role of human agency throughout the AI-generated art process, it is essential to understand that this evolving form of artistic expression is far from devoid of uniqueness or innovation. On the contrary, it introduces novel possibilities, enhancing established styles and forms. As previously highlighted, it contributes to reevaluating traditional aesthetic concepts such as creativity, novelty, authorship, and self-reflection.

For instance, the moments of indeterminacy, contingency, and unpredictability inherent in AI-generated art align seamlessly with the characteristics of contemporary art practices. When AI techniques like machine learning or GANs become creative collaborators for individual artists or artist collectives—a predominant trend in art since the 1960s—the interplay with the uncertainty and contingency of the arts can undergo significant improvement and unique establishment or reconstruction. The term "generative art" has played a pivotal role in contemporary art and aesthetics discussions, defining it as the autonomous creation of a unique work of art that requires continual active participation from the creator, visitors, or audience.

The unpredictability introduced by AI in the creative process contributes to the novelty of AI-generated artworks. In contrast to traditional mediums, where artists maintain a high degree of control, AI introduces an element of chance and unpredictability. This element of surprise, exemplified in the works of artists like Memo Akten exploring neural abstraction, challenges

preconceived notions of artistic predictability. AI's capacity to produce unexpected and emergent patterns redefines creativity as a collaborative engagement with the unforeseen.

As a co-producer or co-actor in art, AI introduces indeterminacy and contingency, themes echoed in science fiction and popular culture. The prospect of self-reflecting machines remains a topic of exploration, emphasizing the interplay between AI and human influence in the realm of the arts. Despite uncertainties about AI's future in the arts, its challenges contribute to an expanded understanding of human relationships with the world.

Artists employing AI techniques often directly address concepts like "intelligence," "cognition," or self-reflection. Reflection becomes a central element in AI-generated artworks and many science fiction movies. For instance, hosts or so-called androids slowly gain self-awareness in the HBO series *Westworld* (2016), breaking free from their programmed stories. Similarly, in Free Guy (2021), a non-playable character named Guy develops intelligence, gradually becoming the game's main character. The idea that a code or algorithm can break free from a predetermined loop and become self-reflective, essentially "free itself," captivates artists, spectators, and gamers.

While the possibility of wholly self-acting and self-reflecting machines is still debated, the content of computer programming, codes, or algorithms continues to be infused by human practice and work. As we teach AI to act more intelligently, it reflects new knowledge about ourselves, particularly in its application in the arts. The future of AI and its role in the arts might be unclear, but the challenges it poses to the arts coincide with the potential expansion of our knowledge about the evolving relationship with the world.

Conclusion

In conclusion, the discourse on AI-generated art underscores the need for a nuanced understanding that transcends binary categorizations. While AI augments aesthetic creativity, it cannot replace the essential human elements inherent in art. The inseparable role of human interaction, perception, and participation in AI practices positions them as specific practices contingent on conditions such as human engagement. Art remains a socio-cultural practice intricately woven with subjective factors, resisting easy substitution by algorithms. This dynamic relationship between AI and artists becomes a driving force, shaping both technological and artistic evolution.

By acknowledging the profound changes instigated by AI in the art world, artists assume a critical responsibility to contemplate and reflect upon the social, economic, and political shifts brought about by this medium. The reciprocal relationship between AI and artists becomes a dynamic force, challenging the limits of computational thinking and creation within artistic expression. Rather than turning away, the art world must actively embrace and dissect the implications of AI, as these challenges become avenues for the continual expansion of human understanding of evolving relationships with the world.

The essay advocates for reevaluating traditional aesthetic concepts, such as creativity, novelty, authorship, and self-reflection, within the context of AI-generated art. The unpredictability introduced by AI in the creative process contributes to the novelty of artworks, challenging preconceived notions of artistic predictability. Despite uncertainties about AI's future in the arts, its challenges contribute to an expanded understanding of human relationships with the world. Artists employing AI techniques address concepts directly, like intelligence, cognition, and self-reflection, emphasizing the interplay between AI and human influence in the arts.

In essence, the conclusion calls for an appreciation of the unique possibilities introduced by AI art, recognizing its potential to enrich aesthetic creativity while underscoring the irreplaceable role of human agency in shaping, guiding, and contextualizing the artistic process. As the art world grapples with the implications of AI, it is essential to foster a dynamic and collaborative relationship that harnesses the strengths of both AI and human creativity in the continual evolution of artistic expression.

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