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The algorithmic art: Exploring the intersection of human imagination and AI technology

Abstract: Today, many people perceive that algorithmic art is the result of recent innovations. The key word here is 'perceive' as neither Frieder Nake (born 1938) nor Harold Cohen (1928–2016), the pioneers of algorithmic art, are rarely mentioned within the current epistemic context. Nake's first public contribution to computer art was in three exhibitions in 1965. Obviously, Nake's and Cohen's roles are fundamental, and their contributions must be considered in any discussion seeking to understand the role of human imagination in algorithmic creation. The present paper aims to address the human role in the creation of art by means of generative artificial intelligence. The creative sector appears to be gradually embracing AI-generated content as one of many categories of images, but it is clear that the worldviews of those involved have consequences on both the AI tools created and the outcome as 'art'. The complex relationship between algorithmic autonomy and human agency is discussed in order to establish any underlying power dynamics and disparities in the technological environment of the 'art' world. This discussion utilizes the case study approach so to examine current applications of AI in creative campaigns in order to provide real-world examples and empirical data.

Keywords: Generative AI, Authorship, Human-machine synergy, Human Imagination, Creativity.

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1. Introduction

The integration of machines into the creative process is not a novel phenomenon. It arguably represents the continuation of a long-standing interaction between technology and what's classified as 'art'. From the invention of the camera to the introduction of digital tools, people have constantly investigated and welcomed new technology to broaden their creative possibilities. The application of artificial intelligence (AI) in photography is another recent chapter in this ongoing story, providing new ways to conceptualize, create, and interpret visual art. In another way, it is possible to argue that it's applying another worldview which can be called a lens, to view the world. Steadman (2001) discussed the experiments undertaken by Johannes Vermeer (1632–1675), a Dutch painter who is thought to have used the camera obscura as a precursor to modern photographic cameras, in order to aid his paintings. The convergence of art and technology arguably roots back to the early twentieth century, when artists experimented with mechanical equipment and processes. The invention of the camera in the nineteenth century transformed the art world by bringing new methods for capturing reality (Osterman and Romer). This revolution proceeded with the invention of digital photography and editing software in the late 20th century, which enabled unparalleled image alteration and augmentation. Yavuz argues that the use of AI in what he refers to as the production of "photographic images could be viewed as a "new method and representation of cameraless photography". He argues that "it establishes an unmediated relationship with the subject of cameraless photography and records it in another dimension of reality". This is a bold statement.

It is well known that Frieder Nake (1938–) and Harold Cohen (1928–2016) during the 1960s made consequential contributions to the integration of computing processes and artistic creativity. Frieder Nake, a German mathematician and computer scientist, is known for his pioneering work in computer-generated art. Nake utilized algorithms as he programmed computers in order to generate abstract designs. This work questioned what were considered traditional concepts of authorship and originality and caused, in retrospect, a reconsideration of the artist's position in the creative process (Nake 62–75).

Harold Cohen, a British artist, made vital contributions with his AI program AARON, created during the 1970s with the goal of producing original artworks on its own. Cohen's work with AARON proved AI's ability to not only help but even independently make art, blurring the distinction between human and machine creativity (McCorduck 108–22). Cohen's use of AI into his practice was a watershed point in the history of art, demonstrating the possibility for robots to contribute meaningfully to creative processes.

These early explorations provided the framework for contemporary artists who continue to test the limits of AI's capabilities. Today, image creation platforms (for want of a better) such as Midjourney and DALL-E empower photographers to leverage the power of AI

to improve their creative processes. Midjourney, an AI-powered image generating tool, provides photographers with new methods to see and edit their work, allowing them to explore hitherto untapped creative potential. As examples of photographers incorporating Midjourney, for example, into their practice grow in number, it is vital to remember that this development is part of a larger historical context. It can be argued that the use of AI in art is not a new phenomenon, but rather a continuation of the artistic legacy of embracing and innovating with emerging technologies. But it can be argued that this 'embracing' is not without problems: it's wise to consider that this must be undertaken with more than an awareness of various philosophical frameworks, the existence of more than one worldview with ethics and value judgements. A discussion of these issues is wise to recognize that the link between human creativity and artificial intelligence is in flux and that the field of photography is shifting.

2. The Evolution of AI in Art and Photography

The integration of artificial intelligence (AI) into the creative processes of art and photography is not merely a contemporary trend but part of a broader historical continuum. This reply is possibly not the answer one has in mind when one reads the headline "A.I. is the Future: Does that mean that photography is dead?" on 23rd December 2023 published by the New York Times (Jacobs). Jacobs's insightful piece directly asks that perhaps no-one wishes to ask regarding AI image generators (such as MidJourney and DALL-E) of the artists using them. He writes on X, formerly known as Twitter, on 4:44 PM · Dec 26, 2023 that he,

> "felt frustrated by much discussion about how this technology is going to break our relationship to images, little mention of the possibility it has long been broken[.]"

His article should raise in the mind of the reader a question which perhaps is not pleasant to ask: what is the future of photography? Artists and photographers since the advent of the camera in the 19th century, which revolutionized the capture and interpretation of visual reality, have continually sought ways to incorporate emerging technologies into their work. While AI has entered into the domain of capturing an image, it's wise to be aware that this shift was on the horizon. The evolution from analog to digital photography marked a significant shift, possibly a revolution, has paved the way for the current phase of AI integration where it is possible to ask: are machines (computers) no longer just tools but active collaborators in the creative process?

Images are manipulated on a daily basis. Adobe Acrobat is commonplace as this software is usable via many people's personal laptop and enables what can be argued as unprecedented manipulation of images through the editing software, Adobe Photoshop. It

is wise to realize that Adobe Photoshop itself is software, a digital environment, where a person can edit and manipulate digital images. It is the latest incarnation of another piece of software which manipulates images, such as photographs, originally called Photoshop. Photoshop was developed in 1987 by Thomas and John Knoll, who subsequently sold the distribution license to Adobe Systems Incorporated in 1988. Five years later, in 1993, Adobe Systems Incorporated included Photoshop in a package they called "Adobe Creative Suite" whereby the user, possibly an artist or a photographer, had the ability to use a range of several image processing, software, tools called "Illustrator", "InDesign", and "Acrobat". In 1994, Adobe Systems Incorporated renamed this program as "Photoshop CS". This platform has developed over the years and since 2007, when the company released "Adobe Photoshop CS3" users, people, who manipulate images, with even more digital tools called 'features' enabling what might be called "greater control" over digital images.

In recent years, platforms like Midjourney and DALL-E have emerged, allowing photographers to utilize AI to enhance and innovate their creative processes. Midjourney, an AI-powered image-generating tool, enables photographers to explore new aesthetic possibilities by offering automated solutions for image creation and editing (Knochel 470–72). The incorporation of AI into photography continues to evolve, with current research exploring the implications of these technologies on the concepts of creativity, originality, and the role of the artist.

The advent of AI tools specifically designed for photography has revolutionized the field, providing artists with new ways to approach image creation and manipulation. These tools exemplify how AI can democratize access to artistic techniques that were previously the domain of highly skilled artists (Gatys et al. 2414–2419). Similarly, Midjourney, as mentioned in the introduction, provides photographers with AI-generated suggestions for composition, lighting, and editing, enabling them to push the boundaries of their creativity.

The use of AI in photography is not without its challenges. One significant issue is the question of originality (Palmer and Sluis). As AI tools become more sophisticated, they can generate images that are virtually indistinguishable from those created by human artists (see discussion by Hausken). Generative AI, as discussed above, is a tool which has been trained to generate more objects, i.e., information, which resembles the data on which it was trained. This data is enormous and can consist of images, text, even sound. The ability of these tools to generate images raises concerns about the devaluation of human creativity and the potential for AI to replace human photographers (Elgammal et al. 3–7). The ability of AI to replicate specific artistic styles has sparked debates about intellectual property and the ethics of using AI-generated content. Unlike traditional AI models, which primarily analyze and process existing data, generative AI is designed to generate original outputs that are often indistinguishable from those produced by humans. This capability is achieved through sophisticated models and algorithms that learn from large datasets, capturing underlying

patterns and structures that enable the creation of new, highly realistic content. One of the core objectives of generative AI is to generate data that is virtually indistinguishable from human-created content. This goes beyond the mere processing or analysis of existing information; it involves the creation of novel data, whether it be text, images, music, or other forms of media (Cevallos et al.; Kar et al.). The scope of generative AI is broad, encompassing a variety of models, each with unique strengths and applications. The core functionality of generative AI models lies in their ability to learn from vast amounts of data. By analyzing and internalizing the patterns present in this data, these models can generate new content that mimics the original inputs, often with remarkable accuracy (Bandi et al.). This learning process is typically iterative, with the model continuously refining its output to achieve the highest possible level of realism. For example, in the case of GANs, this involves a generator model creating new data while a discriminator model evaluates its authenticity, leading to progressively improved results through a competitive process.

Generative AI's applications are diverse and far-reaching, with significant impacts across multiple industries. In the arts, it has opened new avenues for creativity, allowing artists to explore novel forms of expression. In healthcare, generative AI is being used to design new drugs and create personalized treatment plans, enhancing the efficacy of medical interventions. Additionally, in the field of software development, generative AI is employed to automate code generation, thereby increasing productivity and reducing the potential for human error (Kar et al.; Gozalo-Brizuela and Garrido-Merch'an; Epstein et al.; Ebert et al.). The ability of generative AI to produce high-quality, realistic content has the potential to revolutionize these and other fields, driving innovation and expanding the boundaries of what is possible.

The integration of AI into photography has generated significant debate within the art and photography communities. While some view AI as a valuable tool that enhances creativity, others express concerns about its potential to undermine the artistic process. One of the primary criticisms is that AI-generated images lack the depth and intentionality of human-created art. Critics argue that, while AI can mimic human creativity, it cannot replicate the emotional and intellectual engagement that defines truly meaningful art (Boden 75–98).

Another critical perspective concerns the impact of AI on employment in the photography industry. As AI tools become more advanced, they are increasingly capable of performing tasks that were once the exclusive domain of skilled photographers. This has led to fears that AI could displace human workers (Autor 3–10). However, proponents of AI argue that these technologies can complement human creativity rather than replace it, allowing photographers to focus on more complex and creative aspects of their work.

Ethical considerations also play a significant role in the discourse on AI in photography. The use of AI to manipulate images raises questions about authenticity and the potential

for misuse. For example, deepfake technology, which uses AI to create realistic but fake images and videos, has sparked widespread concern about the potential for AI to be used for malicious purposes (Citron and Chesney 150–53). These ethical issues underscore the need for clear guidelines and regulations to govern the use of AI in photography and other creative fields. Lehmuskallio, Häkkinen, and Seppänen concluded that the need, requirement, existed for the development of a visual literacy which understands the computational within digital photography so that viewers when photographs are used, i.e., edited, in newsrooms so that viewers can understand what they are actually viewing on their screens, or published in journals and newspapers so that they, the viewer, learn to recognize whether they are viewing at computer-generated simulations or a photograph.

Hausken (2) takes a different angle arguing that a three-pronged tack is necessary to: (a) develop "concept of photorealism" which is distinct from photography; (b) that photography requires a develop a "conceptual distinction between two basic functions of photography: depiction and detection; and (c) the introduction of what Hausken referred to as "a function-oriented genre concept". These are valid points which should be discussed, particularly since the issue of worldview comes into the discussion in a discussion of a photographic collection which is undertaken, used and viewed within a worldview. The question of worldview becomes more important given the tradition within modern art where new art is created from accumulation of existing artifacts. Manovich debates the fact that while generative AI and modernist art appear to be the opposite of each other, they are in reality similar because the AI generative tools are trained on databases of existing art,

> [...] generative media artifacts are not created from scratch. They are also not the result of capturing some sensory phenomenon—unlike photography, film, video or sound recordings. Instead, they are built from a large archive of other media artifacts. This generative AI mechanism links generative media to certain earlier art genres and media making processes." (Manovich 4).

This means that if 'art' is being discussed, then the issue of worldviews must be discussed. This is crucial given that generative AI tools, while they enable the creation of 'new artworks' are trained on enormous collections of art and media. It raises the question of who's collections of 'art' are these, who owns them, and how do people get access to them, which in turn raises questions of ownership of the 'new art'/new photographs'

AI has the potential to redefine, change the very nature and future of photography as we know it. As AI-generated images become more sophisticated, the distinction between photography and digital art may continue to blur. This could lead to new forms of artistic expression that combine elements of both disciplines, creating a hybrid art form that challenges traditional categorizations (Manovich 23–47). Additionally, as AI systems become more autonomous, they may begin to generate images that reflect not just the input

of human artists but also their own evolving aesthetic sensibilities, raising new questions about the nature of creativity and the role of the artist.

The integration of AI into photography represents a significant development in the ongoing evolution of art and technology. While AI offers new tools and possibilities for photographers, it also raises questions about creativity, originality, and ethics, the use of photography as a research tool (such as Collier and Collier) a source of information not just for researchers (for example: historians), but particularly the public as it has been "trained" since the invention of the photograph to consider its outputs, photographs as reliable sources of information. As the technology continues to advance, it is likely to play an increasingly prominent role in the field of photography, challenging traditional practices and pushing the boundaries of what is possible, particularly regarding what's called 'art'. The future of AI in photography is uncertain, but it is clear that it will continue to be a topic of significant interest and debate in the years to come.

3. Human Imagination and Mind

Now, Hausken (2) discussed at some length the concept of photorealism" which is distinct from photography which in turn touches on the definition of what is 'art' which is admittedly shifting in this age of AI. The integration of artificial intelligence (AI) into the creative arts has generated substantial philosophical debate regarding the nature of creativity and the boundaries between human and machine-generated art. Now, here one must ask: what is AI before asking can it genuinely be considered creative or if it merely simulates creativity based on pre-programmed algorithms. AI is, in reality, a bunch of algorithms created by one or more people, human beings who are creative who use worldview, what might be called a 'lens', if one uses an analogy, to organize information. Now AI, as Boden argues (Boden 2) has two aims, (a) technological and (b) scientific. The first aim is to use computers to get things done, and the second is to use AI concepts and the model to help answer questions about human beings and other living things.

The next question which must be asked, whether we like it or not, is who is building these algorithms? The answer is simple: human beings, probably people who know code. So, the next question is these people will have a worldview, an intellectual framework in their minds, their brains which affect the structure of the data, the code that they write. AI is, for the purposes of this argument, a tool which helps, assists, a human being to be creative, and even more creative. But it does not aid that human to "think" as humans do, and it cannot be creative in the same way as humans, it is biased, and this bias is inbuilt by the scriptwriter, the coder who wrote the algorithms (the AI). The person(s) who wrote the software, the AI, has their own intellectual, philosophical frameworks, theory, whether it is implicit or explicit

and that the tool that they have devised, and probably implements has its own intrinsic intellectual frameworks. The question is whether humans who use this AI recognize this as an issue or just see the AI as 'neutral'. The problem is that these tools are not neutral.

Manovich, an art historian, discusses biases which are pertinent to this question of using AI and the human imagination and data of that AI being deployed. He states (*Data Science* 18) that any,

> "data project, publication, or data visualization includes some aspects of the phenomena and excludes others. So it is always 'biased'."

He maintains that this issue of 'bias' can, in most instances, can be corrected but asserts that the concept of "data" comprehends, "basic and fundamental assumptions" which are important but cannot be modified. This data must be represented, for Manovich (18), as a "finite" set of individual objects" and "a finite set of their features" prior to analysis. Data, he asserted (18), firstly, is the representation of data as modular composed of separate elements (objects and their features) and secondly, these features "are encoded" in a manner that these can be calculated. Data representation, Manovich (18) asserted, has two clearly delineated "types of "things" which are objects and their features". He advances his line of argument by asserting that three decisions are equally significant to represent phenomena as data and making that data "manageable and knowable through data science techniques (Manovich 18). Firstly, for what is selected to be an object, secondly, what features are selected and finally the manner in which these features are encoded.

Lozeno, a digital art historian, argues that "interpretation is always built into any computational analysis". He highlighted the fact that any digital resource or tool, prior to use, already "incorporates a set of assumptions about what is worth looking for, in any given dataset." (Lozeno 4). This is a valid point for any researcher, regardless of their discipline, who uses a digital resource i.e., a digital tool, as they must recognize that each tool has its own set of inherent assumptions. The question exists how the software structures, i.e., organizes the data and how this structure impacts the manner in which the data can be queried, even imputed into the software utilized by the researcher. This structure, software environment, is created by the original coder, the (generally anonymous) software designer(s).

Lozeno's point made in 2017 echoes, those made by Thaller, a historian, a few decades ago, in his (Thaller 196) discussion of whether historians needed to develop a theory of historical computing suggested that historians rather than approach computer scientists as "providers of black boxes to be mechanically applied" should talk to them with problems that they, the computer scientists, might find sufficiently interesting to warrant interdisciplinary research. Thaller's point might be easily dismissed as oh "he's not an 'art historian' or and 'artist' but his point is pertinent to our question as to of the role of human imagination in algorithmic creation because Thaller asserted that the inherent structure of the digital environment

affected the data and the information models that historians dealt with and the software that they utilized. Photographs and flat images are sources of information. Thaller, a historian and inventor of the programming system called CLIO built from 1978 onwards (Nyhan and Thaller 203), describes as a database as follows,

> "A database contains strings of characters, which are organized for speedy processing. It does not contain assumptions, however, what these strings of characters symbolize. To access such a database, it has to exist within an environment of expert knowledge administered by the machine." (Thaller 262)

So, the assumptions about the data are in the minds of the person using the machine, and the database i.e. the information to be worked on, to be mined and questioned. AI tools as with other computing tools requires its practitioners to comprehend that the person(s) who devised the software has their own intellectual, philosophical frameworks, theory, whether it is implicit or explicit and that the tool that they have devised, and probably implements has its own intrinsic intellectual frameworks. Schmidt (1) recognizes that each informs the other and that those researchers, in his example 'digital humanists' who separated the two and put "big T" theory before any empirical" would have problems. He puts it more bluntly (1) "digital humanists who ignore theory entirely jeopardize not only their careers but the soundness of their conclusions." The question here which must be asked is that intellectual frameworks within which people function and then utilize tools, such as AI algorithms, to create things cannot be ignored. Schmidt (1)'s point is that those who come from the digital humanities must be aware that their tools and datasets (evidence) cannot be neutral in their perspective is central to the argument. Essentially both Schmidt and Thaller are arguing that anyone using a digital tool, some AI must recognize that the choice of one's intellectual framework i.e., the chosen theory with a "big T" is affected by the functioning of the software i.e., research tools. AI functions in an environment influenced by the theoretical (philosophical) concerns of those that programmed, i.e., created it. AI functions and 'creates' in a digital environment, framed by intellectual concerns of those who programmed it. Neither Schmidt and Thaller are artists nor photographers but they are concerned with creating, collating and managing large quantities of data be it image and/or textual data as databases, in computers which is subsequently queried via queries, by a person.

Schmidt develops his argument further, arguing that those who self-identify as 'digital humanities' researchers ought to put theory before other considerations to "harness their own creativity towards productive ends" (1). Schmidt (1) qualified what he called 'theory' stating that he meant "social or critical theory—those branches of philosophy that aim to change the world by understanding it. Just which one is not important here, though in practice, that is the only important thing"

So what is important here? What's significant is that everyone, including the person who writes the AI algorithm, has a framework, intellectual perspective which functions within what's called a worldview. So, any AI tools will always contain assumptions and biases, probably of the coder(s). It is impossible for software and tools not to contain assumptions, i.e., 'neutral free', for an AI tool to be used within both a pre-existing value neutral environment which people happen to populate with information in order to do something with it as Boden (2) argues, be it *technological* or *scientific*. The software, within which the AI functions is itself a physical space, created by code according to an intellectual framework and it 'holds' the data so that it can be manipulated according to certain rules was created by people who designed it, wrote the code to create the environment and the rules within which data from the which is to be used to be manipulated These facts are inescapable and to assume otherwise is surely problematic. The original designer, the coder, may or may not share the same intellectual concerns as this particular end-user, the artists. The point here is that the artists or whoever is using the artist tool to be creative are using an environment, a computer, and the software, which has its own embedded intellectual frameworks, derived from computing science, and the task of the person using the algorithm(s) is to recognize that the frameworks of the two groups (computing science and that of the user) must function together. It could be argued that the boundaries of the frameworks, theories, etc., might be more explicit, i.e., readily recognizable and more effectively deployed.

So, two loose groups of people exist: those who develop AI and those who use it, who are usually outside the discipline of those that write (code) the AI. This means that those who use AI tools outside their discipline, risk having little to no control over their design, development, and manufacture. This fact has consequences for the users of those tools, the AI. Huggett states, even though he was writing for archaeologists who both use software, create databases of large bodies of content which they will search for patterns, well, assist them in performing a task involving the use of information (which is also stored, retrieved and manipulated) need to be aware, that in terms of the software that they were using that,

> "their internal modes of operation have to be taken at face value." (Huggett 2)

Huggett was not discussing AI per say, what he labeled as "digital 'cognitive artefacts' that archaeologists use—for example, digital cameras, total stations, laser scanners, proton magnetometers, X-ray fluorescence machines, and their ilk" (2). But the argument remains the same. These items, or 'artifacts' as Huggett refers to them, are tools. So, the boundaries of the frameworks, theories etc., and decisions taken by the developer of those AI tools need to be more explicit, i.e., readily recognizable and more effectively deployed by the artists, by anyone interested in using them. The artists themselves have their own bias, value judgements and codes of ethics. So, let us posit the following scenario. An artist might wish to use a database of images created by a group of people, even another culture. This means that an

artist is using a photograph of an object created within another world view. So, there are two worldviews operating so far: the artist's and that of the people who created the object that they are viewing, but a third exists. This is that of the person or persons who wrote software. If an artist deploys AI in a platform such as Midjourney, they are, without realizing it, adding at least one more intellectual framework onto the data prior to its analysis. As Drucker, the digital art historian, puts it,

> "... the digitizing, organizing, and devising of metadata are always acts of interpretation, the product of a set of decisions that carry interpretative inflection: they are not neutral or value-free, and each privileges one aspect of a digital artifact at the expense of others..." (Drucker 12)

At the same time, it is wise to remember Willmott's point in her (2006) discussion of the problem of the "scientific authority" of the photographs on the Chippewa created between 1890s to 1930s. She discussed the fact that commercial photographers during the 19th century in the US had appropriated the concept of "photographic realism" and "authenticity" and sold vast numbers of photographs commercially (310). It was the same period when anthropologists were trying to establish their discipline as a science, where they were 'scientists' (ibid.). They created collections of photographs as photography was part of their professional toolkit because the photographic record established "hard evidence" of the "real" (ibid.). They followed ethical codes of conduct pertinent to their times, which are not the same as those today. Things in the 'past' will have always been undertaken in a different intellectual perspective, from the present. The past is multi-layered and multifaceted. Arendt (1975) observes the past must not be read backwards nor judged through the lens of the early 21st century. Arendt states,

> "it is quite true that the past *haunts* us; it is the past's function to haunt us who are present and wish to live in the world as it really is, that is, has become what it is now."

So, if a collection of data was collected in the past, and repurposed in a database, digital or not the worldview and purpose behind its creation, and collection must be taken into account. Why? Other agendas and intellectual frameworks are involved in the creation of photographs and manipulating them affects the ethical biases, and other reasons behind the creation of the photographs, or images in question. Shane Balkowitsch and Herbert Ascherman, two photographers, raised the question that history through the manipulation of the images of people taken during the 19th century could be manipulated using Midjourney and possibly misunderstood if the viewers did not understand what had occurred (2023). The issues of bias and ethical codes of practice exist, as everyone involved uses a code of ethics and implicit and explicit biases. These might be difficult to determine, practice, or even implement as

some people appear unsure whether AI affects them as Oldfield (17) argues in the conclusion of her article which is pertinent to our discussion,

> "We can see that there is a large disconnect between people's views of AI and its capability. This may affect the way practitioners develop technology and the way users perceive it."

This could be, as Oldfield (2023b) discusses, in another article, because the vocabulary ascribed to AI makes it appear as part of the human world. Anthropomorphism is used, as Oldfield (ibid) argues, to enable an inanimate device such as AI to be treated and thought of as if it was a person, an animate entity (103–107) so it appears as if the device has human characteristics and behaviors. So, the AI tools appear to be animate, i.e., alive.

So, if we're considering creativity using AI tools we're presented with three challenges to the user, in this instance an artist: give up, adapt or revolutionize. Boden (2001) distinguishes between combinatorial, exploratory, and transformational creativity. But again, whose creativity is this? That of the artists, or is the artist being manipulated by the AI tools, those of the tools written by others? AI may assist in the generation of new ideas or forms, but this process which in fact requires a deep understanding of context, culture, and meaning —elements inherently tied to a human experience, a worldview. But a machine must be programmed by a human to get an insight into that experience—it can never truly have it. The machine, the computer, is not an animate object. It is programmed by people who have worldviews, biases, ethics, and ideas themselves.

At the same time, everyone has their own set of generic questions specific to their formation and their understanding, called a worldview. These explicit but abstract intellectual frameworks are embedded in their examination of both image and of documentary evidence. In the Western world such frameworks, are loftily known as 'philosophies' i.e., idealism, relativism, positivism and so forth.

So, bluntly, flat images, such as photographs, etc., will always be analyzed, viewed and attract attention from practitioners from various disciplines with the consequence that each will apply their own theories, methods, perspectives and so on. Each discipline has its own intellectual histories, traditions and so on. Typically, a researcher from and trained within a Western world, regardless of discipline, has generic questions specific to that discipline to ask of both image and of documentary evidence. Such researchers will deploy intellectual frameworks of some type, i.e., idealism, relativism, positivism and so forth. Simply put, each discipline and person utilizes techniques to gather information, draw on disparate types of information, ask sets of questions, and arrive at one or more conclusions. Research on images using digital tools necessitates a rigorous intellectual base and requires an understanding of the intertwining of theory and practice. Such research requires recognition that rapid-fire decisions over the label of a digital file without explicit recognition of the intellectual

perspective of the creator risks embedding a particular intellectual (a philosophical construct) perspective, especially if the intellectual perspective inherent in the software chosen to manage the data in question is not brought into the mix.

These philosophical structures—frameworks or for want of a metaphor—assist in explaining regularities but are valuable to explain variations in data, i.e., information. As always, theory is deeply intertwined with the methodology adopted by the observer. A good analogy as to its relationship is that of the weave and weft of a piece of fabric. One needs both, as threads, for the fabric to exist and be used. So, a philosophical framework used by a person, a researcher, in turn affects the manner in which results can be understood and subsequently employed. The philosophical framework impacts the examination and interpretation of these images, i.e., what they may have meant or what meaning(s) they hold in both past and present(s).

This is crucial because any interpretive approach utilized, is inevitably informed by the theory, and affects the procedures used to gather i.e., select the data to be utilized and to create whatever is to be created. At this point, it is prudent to ascertain the extent to which grand theory may have affected the methodological approaches adopted. Different theories, perspectives often require (use) different methods. The requirement for an exceptionally rigorous intellectual base is paramount. Theories and practice are intertwined.

Creativity occurs within these frameworks and within each intellectual (philosophical) framework. Each functions, using a metaphor, as each functions as a lens. Each framework influences the methodologies and the questions asked, and by default even the software and hardware employed in processing the data. The choice of such framework is invariably dictated by a combination of intellectual fashion, practicality, and worldview. The choice will inevitably change as ideas change and disciplines continually morph. The history of the various disciplines inevitably influences the choice of methodologies, and conceptual vocabulary.

Worldview:

The situation becomes more complicated if the dataset of images and other information is one whose origins are drawn from world view. Artists may originate from the Western European/Judeo-Christian/Western world, from the one within which the AI tools were created. Different frameworks will categorize information differently affecting the manner in which ideas, concepts, perceptions, beliefs, information, to be processed, used and stored in conceptually manageable units. These include the manner in which information is stored in a digital environment. The implications of this are not obvious, but are crucial if one is using an AI tool developed from another point of view. It is inevitable that an artist, a person

to use, i.e., 'pick' one or another philosophical framework perhaps influenced by intellectual fashions or even cultural background.

So far, the subject of ethics and value judgements have not been touched upon with respect to creativity or worldview. To avoid these topics is admittedly naive, as algorithms, AI tools, are created by people i.e., coders, the writers of those algorithms, who have worldviews containing implicit and implicit regarding ethics and value judgements. These cannot be avoided by 'creators' as Tang (57) refers to them or as artists, or photographers. What is striking about Tang (2023) discussion and that of Yavuz (2021) is that these artists/photographers are vague abstract entities without ethical codes of conducts, value judgement and with unknown worldviews and neither consider what might be called 'art'. Now, 'art' is a tricky thing to define, as it depends on the worldview being utilized. Now, in the Western European worldview, photography is often used as 'art' and can be used to record 'history'. Hausken (6) argues that when images are created by someone using a camera that the information is "transformed into a visual expression" which can be according to Hausken (ibid) "a depiction, a figurative image, or a visual representation of a scene" and even "abstract art". Hausken cited Rossbach (2011) to assert that numerous techniques are utilized to "record....an abstract photographic image" such as different types of lenses and exposures. So, Hausken argues that what is labeled,

> "a[A]bstract fine art photography is nevertheless generated in the same way as other photographic images. And its character of being a recording of certain lighting conditions is vital for the experience that the exhibition of the picture facilitates." (Hausken 6).

During this process judgments are made regarding ethics and value which are integrally connected, integrated, with the worldview of the person using the camera, taking the photograph of whatever is at hand. Photography can be considered 'art' as can the image(s) or item(s) being photographed. The question of the definition depends on the worldview of the person taking the photograph, the photographer, and the viewer of the photograph. The topic of whether photographs are 'art' is tricky for Hausken but this issue becomes more complicated when discussing what is "art" when in a discussion of the images, the 'art' of other cultural groups. This is a tough topic to understand in the abstract. Colson, one of the authors, presents an example.

An example:

Globally, images called 'art' are produced in a variety of contexts (MacDonald 2014 MacDonald, 'Sacred Traditions and "Art" in Hunter-Gatherer Contexts.'). The images used as an example are of a pictograph or a rock image site, see Figure 1, of the Lake of the

Woods in Northwestern Ontario, Canada. They were created by, used by and belong to the Algonquian speaking peoples, the Cree, Oji-Cree and the Ojibwa, of central North America. These types of images are selected as examples: though often remote, they have been investigated by practitioners from a range of disciplinary groups.

These images on vertical rock surfaces belong to a larger group which were created and are currently used to communicate, and the other objects have been examined over many decades by scholars from a range of disciplines: archaeology (for example: Conway 1990; Creese 2011 & 2017; Jones 1981; Pastershank 1989; Rusak 1992; Norder 2012 & 2018), history (Bohaker 2010; Willmott 2016), art history (Arsenault 1994, 1996; Vastokas and Vastokas 1973; Zawadzka 2008, 2013), anthropology (Lanoue 1990; Lemaitre and Decart 2008) and other interested individuals (for example: mathematics (Closs); geology (Lawson); philosophy (Pomedli); medicine (Wellman). But the attitudes, perceptions, and the discipline of each researcher inevitably influenced the examination of other Algonquian images, whether etched (Dewdney 1975; Spagna 1998), bitten (see: Oberholtzer 1994) quilled (see: Garte 1985), embroidered (see: Penney 1991), drawn (see: Vastokas 1996) or beaded (see: Gordon. 1992; Lanford 1984; Whiteford 1986) and exist on a wide variety of objects (see: Densmore 1974 [1928]; Phillips 1999; Ritzenthaler and Ritzenthaler 1970; Willmott 2016). Images similar to those found on rock surfaces of the Canadian Shield are encountered in other cultural contexts (Phillips 1999).

The red images found on the vertical surfaces of the vertical cliff faces of the PreCambrian Shield, called 'art' by researchers educated and trained within the Western European research tradition in archaeology and anthropology. These images lie on the vertical granite cliff faces on the shores of many lakes such as Lake of the Woods, Route Lake and Lake Superior in Northwestern Ontario, Canada which itself lies in the Boreal (coniferous) on the PreCambrian Shield (Gardner 1981). The images, created by the Algonquian speaking peoples, are polysemic in their meaning, form of communication, and may be mnemonics known and understood by the shamans and the members of their communities who were both familiar with and understood these meanings. These red images exist in the middle of landscapes, outside. Their existence in the challenging environment of the vast Boreal Forest environment means that different researchers predominately from art history, anthropology, and archaeology have been drawn to the challenge of understanding their meaning, present, past and future. The existence of the images has influenced which western European discipline chose to study them.

Different groups of researchers, in disciplines, recognize that since the world of the Algonquian speaking peoples is animistic these images are integral to the physical, social, mental, and spiritual landscape of their world. Indigenous knowledge and ontologies are key to dealing with these specific images (see: Johnston 1976 & 1982; McPherson 1998). It is clear that barriers exist in terms of their understanding by non-Indigenous settlers who

now live there and/or study it. Now, what is called 'art' and a 'photograph' in the western world view has a place in a hierarchy. The problem is that words are needed to describe these images, but they for the Indigenous peoples are a form of communication. The question is how to unpack them. One might describe it because describing an image is one thing, interpreting it, is another. Any description, the words themselves, affect subsequent analysis. These images form from another mindset, or worldview.

The 'art' in the Western European world is shaped by a tradition where different creations are classified into a hierarchy. So, for these images, the term 'art' is problematic as it might suggest that these images have primarily a decorative value and no intrinsic value or meaning of their own. The designation of these images often called 'pictographs' started centuries ago with the onset of Europeans to the geographical region (for example: Schoolcraft; Bell; Lawson) followed by other researchers talked to Indigenous peoples who had long inhabited the region. However, the ethnographic information recorded regarding the pictographs was sketchy and many non-Indigenous researchers reported that their Indigenous informants provided very little information regarding them. It is probable that the Indigenous people did not wish to talk about these places. The questions asked by the early arrivals, researchers, white settlers were influenced by their experience which in turn affected their perspectives, attitudes, and perceptions towards the Indigenous peoples who they consulted about the images.

The word 'art' implies the researchers follow the classification following Kant, with levels where the highest form is 'art for art's sake' and the lowest is a mere 'craft' utilitarian. According to Hegelian ideas of human progress, 'art for art's sake' symbolizes the existence of an advanced civilization and the continued use of the word 'art' implies classification of these images according to Western notions of high or low art, or, grading down to a craft.

But neither these red images on granite nor the images which appear on other physical items (such as birchbark, cloth, etc.) created by the Indigenous people should be considered within such a perspective. Perception, classification, even prejudgment radically affects the manner in which images are dealt with and analyzed (Blocker 1994; Conkey 1987; Frank; Price 1989). Frank (2000, 1–18) debated the development of the theories whereby objects and images became labeled as "decorative" or "fine arts" or handicrafts. These are words which have loaded meanings which impose the analyst's conventional values, as many have discussed (see Phillips and Steiner 1999).

But despite these dangers, researchers concerned with the red images on the vertical cliffs of the Canadian Shield persist in using the term 'rock art' (see: Creese 2011; Norder & Zawadzka 2016; Tapper 2020; Tapper et al. 2021). Acceptance of the term 'rock art' just because everyone uses it as Whitley (2001, 22–23) argues because this has occurred for more than a century is highly problematic. Such practices viewed through the prism of colonialism become suspect. Mere longevity alone fails to justify its continued usage,

particularly since the problematic use of that practice is and continuing such a practice due "unspoken 'tradition" within a discipline goes nowhere. This, since labels have power and act as indicators for a body of knowledge. The words 'rock art' implies value judgments from another world view, not the one that created it. The labels: 'art', 'rock art', 'rock paintings', and 'pictographs' are used by those researchers who are from what George Kenny (pers. comm. to Alicia Colson, 21 March 2021) labels as the Outsider world, i.e., a person who has grown up and been trained in the Western European worldview. The word 'art' imposes on it outside hierarchies and risks perpetuating existing problems. Researchers concerned with these images recognize, i.e., acknowledge, that 'western art' is shaped by a tradition where different creations are classified into a hierarchy (Phillips & Steiner). As Phillips and Steiner asserted that the cultural objects of the Other was

> "appropriated into two of these categories: artefact or ethnographic specimen and work of art." (Phillips & Steiner 3)

Twance (2017) from the Pic Mobert First Nation, in the Canadian Shield, in Northwestern Ontario, Canada introduces the term "mazinaabikiniganan". She (2019, 1331), states that the Anishinaabe peoples in this geographical region of North America use "mazinaabikinigan", the singular form of the word. The word "mazinaabikiniganan" is the plural form of the word (Twance). The words for Twance, transmit cultural connotations, connections and intrinsic biases and prejudices. So, if photographs of these images which she describes, in her work, found on the shores of Lake Superior, are digitized, these biases and prejudices will only be compounded. It might be equally possible that this is not the case. Twance (2017) asserts that numerous Indigenous interpretations exist for these images.

> "Mazinaabikiniganan, commonly known in English as pictographs or rock art, typically have been examined through a historical lens in anthropology, archaeology, and art history. Described by Dewdney and Kidd (1967) as "the mysterious red markings of the aborigine" (5) and by Clottes (2008) as "the only concrete intelligible expression… of lost Indigenous civilizations" (1), the prevailing attitudes of Western scholars are made plain. Mazinaabikiniganan are presented as mysterious or unknowable and often attributed to cultures that no longer occupy the landscape. These disciplines have a long history of attempting to understand who created these images and for what purpose, working under the assumption that this knowledge is on the brink of being, or already has been, lost forever (e.g., Clottes 2008)." (Twance 11)

Twance recognizes that these images (the pictographs) are discussed in several languages: including English and the languages of Indigenous peoples. Researchers usually publish textual materials on these images in English or French. Twance (2017 and 2019) from the Pic

Mobert First Nation and George Kenny, an Cree Knowledge Keeper from the Lac Seul First Nation, who are Anishinaabe, know that the words used to describe these images transmit cultural connotations, connections and intrinsic biases and prejudices. These red paintings are not 'art' to the Anishinaabe.

Hierarchies of visual imagery do not exist within Ahnishinahbayeshshikaywin as practiced in Lac Seul First Nation, one of many Nations in northern Canada. So, according to George Kenny, a Knowledge Keeper from this community, these labels must not be used (George Kenny pers.com. 5 May 2021 to Alicia Colson). He states that these images, paintings should neither be incorporated into nor defined by another worldview, classificatory system. The places where they exist are spiritual places, ceremonial sites, and have symbolic relationship with other-than-human beings. Kenny, states that these images from the perspective of someone who uses and practises 'Ahnishinahbayeshshikaywin' which 'Outsiders' (ie people who are not from his community of Lac Seul First Nation), call animism. Ahnishinahbayeshshikaywin is a form of animism. This word describes practices which establish a relationship between places and people, a belief in souls, and the existence of human souls after death. A person who believes in Ahnishinahbayeshshikaywin considers that mountains, rivers, land, plants, and trees have souls as they are animate. Animism is the word and a concept used by researchers who have a western European worldview (Kipfer; Smith). Western researchers use it to describe the practices which establish a relationship between places and people, a belief in souls, and the existence of human souls after death. Animism is not a religion but a label, a world view, a mindset. It influences ethical judgements, values held by those who use and practice. Those who have this worldview recognise and acknowledge that relationships exist between nature and the animal world which has power over humans and that these relationships must be respected.

So, any image created by the Anishinaabe to be discussed or used in an AI system must be understood within the worldview, Ahnishinahbayeshshikaywin, as practiced by those who live nearby them. So, in the case of those created by the people who are from George's community, must be understood within the world view labeled as Ahnishinahbayeshshikaywin in the Lac Seul First Nation. All images created within Ahnishinahbayeshshikaywin, the world view used by those who live in the First Nation, such as those on the surface of the rock surface are neither 'art' nor 'rock art' (George (Choch) Kenny pers. comm. date). An image, a red painting, found painted on rock granite wall is an act of creation and production by a person whether an apprentice medicine man or an apprentice who was instructed by a medicine man [Kekinoamaged Anishinaabeg Mushkikiewak] which is and was part of life of the Lac Seul community. Medicine people [Anishinaabeg Mushkikiewak] shamans, polymaths, who were teachers [Kekinoamaged] with apprentices created these red images (George (Choch) Kenny pers. comm. date).

Therefore, if one wants to consider the ideas of dealing with different worldviews, AI tools must be developed in ways that are ethically responsible where being 'ethical' means

that it aligns with the worldviews that the AI needs to be built in, used and applied. The onus is on the developers who write these tools to comprehend the worldview(s) of those who use it. So, while it is argued that AI operates without intention in the human sense, it is not operating neutral. It operates, i.e., undertakes tasks based on the data and instructions provided to it by the original coder. But it is not animate, and it does not possess consciousness or subjective experiences that inform its decisions. It cannot be creative as it is a coded tool within an environment, a machine. It could be argued that the choice of a philosophical framework and inquiries into AI creativity touch upon the notion of intentionality, but that intentionality is programmed into it. Furthermore, it is not creative. The AI tools and the environment within which it exists, the computer, is not animate (it does not life nor can it live on its own. These AI tools were created by one or more people who hold specific world views, codes of ethics and who have value judgements. This is the case even if the AI is to function on datasets, as these datasets are created by people. So, the worldview of those involved in the coding is embedded into the tool, at the very outset of its creation, prior to its implementation, in its design.

Conclusion

The dynamic and changing link between human creativity and algorithmic art has been critically investigated in this research, highlighting the significant impact of various worldviews on the production and interpretation of images. The relationship between technology and art has historically reflected larger changes in society, and the use of AI in creative processes today is just another step along this trajectory. The study emphasizes that although AI tools have great creative potential, their design is inevitably influenced by the cultural and philosophical prejudices of those who created it. The values and presumptions of the people who create the art are infused into the algorithms that produce it, and these biases are reflected in both the final product and the interpretation that follows. As algorithmic art develops, authorship and originality are being redefined. With their unparalleled powers, tools like Midjourney and DALL-E upend preconceived notions about the creation of art. However, as these instruments become more advanced, it becomes harder to distinguish between the creative processes of humans and machines, which raises important questions about the direction of art and the changing role of the artist.

AI technology and human imagination coming together offers both potential and challenges. Although AI has the potential to unleash human creativity, it also raises difficult moral and philosophical issues. Traditionally the domain of human endeavor, the artistic process is now shared by machines that can create content, imitate styles, and even invent new forms of expression. The fact that these machine-generated works are ultimately expressions

of the data and algorithms designed by people, however, confirms that algorithmic art still heavily relies on human imagination. Future studies should look more closely at the ethical implications of AI-generated art, especially as they relate to ownership, authenticity, and the possible decline in human creativity. Furthermore, investigating how various cultural frameworks impact the creation and use of AI in art might provide important new insights into the ways in which technology both affects and is influenced by the diversity of human viewpoints. Navigating the future of art and technology requires a grasp of these complex dynamics, which are becoming increasingly prevalent as AI permeates the creative professions.

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