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ARTIFICIAL INTELLIGENCE AND CREATIVITY: IS AI REALLY CREATIVE?

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Abstract
The field of Artificial Intelligence has been marked by great optimism about the possibility of not only a humanoid AI but also an ultra-intelligent AI that surpasses human intelligence and creativity. Attributes such as thinking, desire, and imagination -that were hitherto exclusive to humans and only metaphorically applicable to organic non-humans are today shown to be real attributes of non-organic, material Artificial Intelligence. Creativity is one of these attributes he optimism for computational creativity has been on the ascendance given the unprecedented quantum of breakthroughs that have continued to attend the field of Artificial Intelligence in recent times, making impressive overtures in the creative fields of music, designs, architecture, visual arts, literature, medicine, research, etc. It is increasingly begging the question of what it means to be a creator in an age of artificial creativity and what is the essential element of creativity. This is even more, especially today there is the preponderance of –machine learning specifically deep learning –which uses the layered structure of algorithms in the imitation of the neural structure of the human brain and whose ascendance has been given impetus to with access to the umbrage amount of computational power and digitized training data. The work is therefore set to respond to the question of whether machine creativity is really creative. It does this using the methods of analysis and hermeneutics by critically looking at the claims of computational creativity. In its philosophic engagement with the concept of creativity and the creative process in general, it discovers that creativity is a conscious intentional act that involves freedom and autonomy, intentionality and understanding, and imaginative thinking. Notwithstanding the controversies that surround many of these concepts, the research finds that these concepts can hardly be rooted in materialism which is the building block of Artificial Intelligence. It thus describes AI creativity in terms of an optimization, and augmentation, of existing human creativity.

Introduction
From being a fictional theme in dystopian literature and an important element of science movies, Artificial Intelligence (AI) has not only entered the laboratory cubicles but has also become a common-place phenomenon, making impressive overtures in the creative fields of music, designs, architecture, visual arts, literature, medicine etc. It has since become a substantial element of what has come to be known as the Fourth Revolution. There are AI programs that have been able to write better, code faster, and generate unique imagery at scale. They have been used to create content on social media channels, produce entire blog posts, etc. In 1997 JAPE, "the Joke Analysis and Production Engine" was built at Edinburgh University by Kim Binstead. It was able to generate puns which when tested, many were genuinely found funny even if by an audience of children. In the same year, Gary Kasparov, world chess champion, lost a match to IBM's Deep Blue computer wherefore Kasparov remarked that he could "smell" a new form of intelligence across the table.[1] Computer scientist, Stephen Thaler

[1]Russ Pearlman, "Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law," 24 Rich. J.L.&Tech. no.2, 2018

claimed to use his neural networks to develop what he refers to as a "creativity machine" which he credits to be the inventor of the subject matter to his 1998 patent, "Neural Network Based Prototyping System and Method."[2] This Creativity Machine was said to have "formulated chemical formulas for new ultra-hard materials which could easily be enhanced to include now methods of making composites so that it can be reduced to practice without substantial assistance from any person-meeting the general obligations of patentable compounds."[3] In 2018, a painting entitled 'Portrait of Edmond Belany' was part of a series of ten portraits in a series titled "La famille de Belany." This work sold for $432,500, was a picture created by an algorithm put together by Obvious, a Paris-based collective exploring the space around art and artificial intelligence. This is an example of General Adversarial Networks (GAN) which is one of the most promising paths to grow the affordances of AI machines given that it can be taught to "create worlds eerily similar to our own in any domain: images, music, speech, prose."[4] An AI machine in 2016 composed polyphonic baroque music, bearing the style of Johann Sebastian Bach.[5] AlphaGo Zero was an algorithm designed by Google's Deep Mind division, a neural network that taught itself the complex game of Go becoming the best Go-playing algorithm ever designed easily beating both its predecessor AlphaGo, which itself had beaten the 18times world champion.[6] The makers, David Silver and Demis Hassabis note that it "discovered new knowledge, developing unconventional strategies and creative new moves that echoed and surpassed the novel techniques it played in the games against [human Go Masters] Lee Sedol and Ke jie." In 2020 the academia was rocked by the news of the release of the AI chatbot ChatGPT (Generative Pre-trained Transformer) which is an autoregressive language model that uses deep learning to produce human-like text.[7] Many speak of GPT in terms of authorship or co-authorship.

It is thus, increasingly begging the question of what it means to be a creator in an age of artificial creativity and what is the essential element of creativity. This is even more needful, especially today that there is a preponderance of -machine learning specifically deep learning which uses layered structures of algorithms in the imitation of the neural structure of the human brain where human agency appears not to be obvious, especially in terms of the end user. Creative Adversarial Network (CAN) is said to be an example of AI technology that relies on inputs of preexisting pieces of art to create pieces of original art that could pass as human-

https://jolt.richmond.edu/recognizing-artificial-intelligence-ai-as-authors-and-inventors-under-u-s-intellectual-property-law/

[2]Pearlman, "Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law," See Ryan Abbott, I Think, Therefore I Invent: Creative Computers and the Future of Patent Law, 57 B.C.L. 1083-1085, 2016

[3]Pearlman, "Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law," See Ralph D. Clifford, Intellectual Property in the Era of Creative Computer Program: Will the True Creator Please Stand Up? 71 Tul. L. Rev. 1675, 1695 (1997)

[4]Daniel J. Gervais "The Machine as Author" *105 Iowa Law Review* 2053, 2020. https://scholarship.law.vanderbilt.edu/faculty-publications/1164

[5] Gervais "The Machine as Author."

[6]Katharine Stephens, "Who owns an AI-generated Invention?" 2009 https://www.twobirds.com/insights/2019/global/who-owns-an-ai-generated-invention

[7] "GPT-3" en. m. wikipedia.org

made.[8] These and more have fuelled the view that Artificial Intelligence has become a creative producer challenging the long-held view of creativity as a fundamental feature inherent in human intelligence and fundamental mental signatures of human-kind. The question of AI as creators or co-creators demands and touches on the ontological question of what actually is Artificial Intelligence, a tool or a person; a product or a producer; an artifact or artist-actor with autonomous capacities? Marcos Wachowicz and Lukas Reuthes Concalves in "Artificial Intelligence and Creativity: New Concepts in Intellectual Property" write about AI as the possibility of "detaining the ability to think for itself, a condition originally inherent to man in his process of cognition." For them, AI has the ability "to perceive and understand the world around him and seek quick and accurate solutions. Recognizing the gradual ubiquity of AI which they consider creative, they seek legal protection of "creative works made by AI applications through copyright law, the Berne Convention and the national Brazilian law."[9] The reference to copyright law raises again the ontological question and shows a certain humanization of AI, the idea propelling the progress recorded in the field of Artificial Intelligence. It raises rather conspicuously the question of the creativity of Artificial Intelligence. Can AI be said to be creative as to be ascribed ownership of its output? Is creativity simply computational? In attempt to respond to this questions, the work is sub-divided into a number of sections, where the first deals with the general notion of creativity and the distinguishing marks of creative outputs; the second focuses on the very process of creativity; the third which is an arising from the second deals with the agential requirement of creativity in which creative process is shown to be an intentional process. The last is the crux of the research in which the question as to whether AI is creative is attempted.

Creativity and Nature of Creative Output

Creativity is the ability to come up with something new especially in an unpredictable and sometimes impossible way. Novelty and originality form one of the essential characterizations of creativity. Thus, an object is creative only if it is new. As Stokes points out, identifying novelty as a condition of creativity has analytic challenges: what is novelty, and in what way is the object novel? Is every event in or property of the object novel or is it merely necessary that some percentage of properties be novel, what is the nature and extent of this percentage? Joseph Addison following the ideas of 3rd century AD critic Longinus endorsed a notion of natural genius that creates a new absolutely. Peter Kivy recounting Addison's notion, notes that according to the latter the natural genius is outside all conventional realms creating art without any knowledge, a kind of creative primitive. The natural genius contrasted with learned genius creates something truly original. Thus, for Addison, the novelty condition is simply absolute. The same absolute novelty is found in Kant's conceptualization of genius. Kant writes in his Critique of Judgment that "Genius is the innate mental predisposition (ingenium) through which nature gives the rule to art."[10] Thus genius is such that he gives the rule to art with his artworks and it is from these that rules which govern others are extracted for imitative purposes. This obviously describes absolute novelty as a condition of creative genius.

[8] Megan Svedman, "Artificial Creativity: A Case Against Copyright for AI-Created Visual," *IP Theory*; vol 9 https://www.repository.law.indiana.edu/ipt/vol9/iss1/4/

[9]https://www.academia.edu/43400097/Artificial_Intelligence_and_Creativity_new_concepts_in_intellectual_property

[10] Kant, *Critique of Judgment*, p.174; see Dustin Stokes, "Metaphysics of Creativity," in Kathleen Stock & Katherine Thomson-Jones (eds.) *New Waves in Aesthetics*, New York: Palgrave-Macmillan, 2008, pp.105-124.

According to Peter Carruthers, creativity goes beyond mere re-applications of established scripts or action-patterns. It involves in part a capacity for combining ideas together in novel ways in abstraction from any immediate environmental stimulation. Thus, the adoption of novel solution to environmental problems is creative action while merely applying an old solution to new circumstances is not creative.[11] This product is not just something new but also surprising and valuable.

The elements of value as well as surprise are added so that creativity does not dovetail into anything at all. Recognizing the need to rule out cases of worthless originality, Kant argues that "since there can also be original nonsense, its (the genius') products must at the same time be models, i.e., exemplary."[12] Yet the case of malevolent or dark creativity such as the production of mass destruction techniques or the smart execution of terrorist acts seems to question the value criterion. Berys Gaut argues that the latter question brings back the problem of the possibility of counting original nonsense as creative.[13] But I do not think that such original nonsense would ever attract a surprise response but the malevolent products could. Perhaps this is the reason that Alison Hills and Alexander Bird hold the view that the argument of the possibility of producing an original nonsense cast in terms of creativity is unsound.[14] It is the view of Hills and Bird that creativity does not require the production of valuable objects. According to them, "The creative disposition may produce objects that completely lack objective value, attributive value (a thing being valuable of its kind), and value, either subjective or objective, to the creative person." Continuing they submit that "It is also possible to recognize items as creative without making any judgment about their value."[15] It seems that Gaut and Kieran agree with this instrumental view which acknowledges that not all exercises of creativity are valuable, meaning that it has conditional value and given such circumstances many a time are made possible by agential powers, creativity has both instrumental and final value.[16] I see the reference to original nonsense as a methodic way of calling up other criteria in the course of articulating the nature of creativity. Novitz, among other scholars, does not attribute genuine creativity to such products. For him, the creators are simply ingeniously destructive.[17] The problem here is that Novitz' view fails to deal with the fact that people generally consider such acts as creative. Most often when they meet creative criteria, they strike a chord of surprise in people. Of course, this already casts a slur on the value criterion. This may have informed the functionalist model for which the creativity of an act depends on its original and effective in promoting its agent's purposes. This model is in sync with Paisley Livingston's consideration of originality in terms of effective means to some end. Livingston does not place strong emphasis on value requirement. Creative actions involve instrumental

[11] Peter Carruthers, "Human Creativity: Its Cognitive Basis, its Evolution, and its Connections with Childhood Pretence," *Brit. J. Phil. Sci.* 53 (2002), 225-249, p 225.
[12] AK 5:308
[13] Berys Gaut, "The Philosophy of Creativity" *Philosophy Compass* 5/12 ,2010 p.1040
[14]See Berys Gaut and Matthew Kieran, "Philosophising about Creativity," in B. Gaut and M. Kieran (eds.) *Philosophy and Creativity*, Rutledge, New York, 2018, p.17
[15] See Gaut and Kieran, "Philosophising about Creativity," p.16
[16] Ibid., p.17-18
[17] David Novitz, Creativity and Constraints, *Australasian Journal of Philosophy* 77 (1), 1999 67-82, p.78; See also David Novitz, "Explanations of Creativity," *The Creation of Art: New Essays in Philosophical Aesthetics*, Eds. Berys Gaut and Paisley Livingston, Cambridge: Cambridge University Press, 2003, pp.186-7

value and end need not be intrinsically good. It may be indifferent or even bad.[18] This model considers such malevolent acts genuine creativity. The problem is that it seems that if such acts of say terrorism are foiled then they could no longer be considered creative. Perhaps it is better to consider creative value in terms of its potency rather than the success, that is, on whether it can rather than that it actually did. This may however open up the floodgates of acts that jostle and lay claimant to creativity. Klausen seems to share the same view when he writes that demanding the element of success on creativity seems overly restrictive. According to him, creativity could still be characterized as such even when it fails to furnish a satisfying result. For him, while deriving inspiration from a dominant epistemological theory of reliabilism[19] he argues that "it is preferable to speak instead of a process which has a *propensity* for resulting in a novel work."[20] Thus "a process with a significant propensity for leading to creative achievements may be deemed creative even if the actual outcome doesn't exhibit the desired quality."[21]

Creativity and its Process

The discussion here looks at what precisely marks out creativity, and then what precise attribute is it. This is because the term creative is usually employed to qualify three kinds of things, namely, a person, a process or activity, and a product. These three reflect the three bearers of creativity in ordinary language. Thus, people say such things as "Junior is very creative"-(person); "it was indeed a rigorous and creative process you have been through"-(process); "That is one of the most creative lines I have ever seen"-(product). Dustin R. Stokes in his "A Metaphysics of Creativity" though with a focus on artistic work observes that the bulk of works on creativity have been studies of radically creative persons, geniuses. This is true of Plato, Kant whose studies were on geniuses. Yet it does seem that this focus led to a mystification of creativity. Stokes however argues that geniuses are generally valued not for their sake but for their creative products and/or for the creative processes put into in the creation of a particular product. This shows a connection between genius and the product as well as the process. Thus, simply focusing on the person would not suffice.[22] Scholars are varied in their opinions on which of the three notions, if any, is explanatorily basic. For Stokes, creativity is primarily an attribute, not of products, but of mental processes. For some scholars like Caroll (2003), and Haper (1989), the fundamental explanatory notion is that of creativity of artifacts; for psychologists like Boden (1990), Simonton (1999), Harre (1981), Polanyi (1981), Taylor, the more fundamental is the creativity of ideas or of mental processes. These divergent views have led to a number of divergences in the creativity literature which runs along the lines of creativity of acts and creativity of product. For instance, there is the distinction between subjective and inter-subjective creativity by Fred D'Agostino.[23] Amabile is one of the scholars who favour

[18] P. Livingston, "Poincare's Delicate Sieve: On Creativity and Constraints in Arts," in M. Krausz, D. Dutton and K. Bardsley (eds.) *The Idea of Creativity*, Leiden: Brill, 2010

[19] Reliabilism takes a belief to be justified if it has been produced by a sufficiently reliable process, that is, a process with a significant propensity for producing true beliefs. This allows that a belief can be justified even if it happens to be false. See A.I. Goldman, *Epistemology and Cognition*, Cambridge, MA: Havard University Press, 1986.

[20] Klausen, "The Notion of Creativity Revisited: A Philosophical Perspective on Creative Research," *Creativity Research and Journal* 22(4), 2010, p.349

[21] Ibid., p.349

[22] Dustin R. Stokes, "Metaphysics of Creativity,"

[23] F. D'Agostino, Chomsky's System of Ideas, Oxford: Clarendon, 1986, p. 175-6.

product primacy in the treatment of creativity. Here methodological consideration seems to be the major factor. In real terms, it is the view that "it is easier to examine products than processes or personality traits." It is difficult to judge the quality of a process except by its fruits. There may be other conceptual considerations. Klausen finds a pure process view almost unintelligible. According to Klausen, "The product has a certain priority; talk about creative persons and processes are derivative, although the link can be merely indirect, allowing for creative persons and processes which happen to be unsuccessful.[24]

The reference to the indirect link to product and process brings to mind one of the criticisms advanced against product orientation, namely, that it is not in all cases that creative processes engender creative output. This is the reason that Klausen makes a move from the actual production view to the propensity-for-producing view. According to him, the move severs to some extent the link between process and product while retaining the definitional priority of the product.[25] Klausen has a broader conception of creative product which does not yield exclusively to the verificationist demand but goes to include intangible things like "self-development, enlightenment or seeing the world with fresh eyes."[26] The view of Klausen is understood. The creative product indeed has some form of priority but I do not think this should be understood as a definitional priority. I choose rather to underscore that both the process and product of creativity each has some forms of priority. While the product in being expressive of the process and being the end could be said to have some form of epistemological priority in terms of being the reality that is first perceived, the process enjoys an ontological priority relative to its product. Thus, both must have some definitional importance. What should be harped is an integrated definition. This is because the process provides a quality without which creativity cannot be characterized as such. Even originality which seems to be the quality of the product can also be adduced to be that of the process. There must be something original and new about the process to engender a new and creative product. Ian Jarvie distinguishes between subjective and objective creativity in which subjective creativity is "a property of persons or their minds," whereas objective creativity is "a property…of created works."[27] Well the truth is that the present researcher is averse to such kind of distinction that betrays the history of polarization in Western thought. It is even more that such distinction is being introduced into such concept and phenomena like creativity which is itself inherently marked by certain dynamism and profundity and which for the present researcher is a process phenomenon. The creative product is an expression of the creative mind which itself is known by the same product. The product is a pointer to a certain mind which created the product. Both live in a symbiosis in terms of origin and expression. In judging creative output, the latter is never divorced from the creative process. Gaut and Kieran accordingly argue that this could be seen in the relationship between originality and creativity. A product could be original without

[24] Klausen, "The Notion of Creativity Revisited: A Philosophical Perspective on Creative Research," p.352
[25]Ibid., p.350
[26]Ibid., p.351
[27] Ian C. Jarvie, "The Rationality of Creativity" in D. Dutton and M. Krausz (eds.) *The Concept of Creativity in Science and Art*, Dordrecht: Martinus Nijhoff, p.117.

being the result of creativity.[28] The corollary is that the definition of creativity must also pick out something about the kind of process involved.[29]

Agential Requirement for Creativity: Creativity as an Intentional Process

Agency in particular has been tipped by scholars such as Gaut, Stokes, and Kieran to be usually constitutive of the creative process. Agency and with it, purpose that derives from the process itself is necessary for identifying and characterizing creativity and its product. Scholars like Denneth[30] however seem to be of the view that the creative process need not be agential at all. This is because he takes the position that biological processes may be creative. Elliot Paul and Dustin Stokes argue against a product-based definition of creativity highlighting the incompleteness of such a definition. Creative product, they thought must be also the outcome of the right kind of process. According to them, the process is one that non-trivially and essentially involve agency. They justify their submission on the process requirement and its agency coordinate on three counts. The first is the argument from justificatory practice which is about the fact that people in attributing creativity to product give reasons that appeal to the agentive processes that gave rise to the product; the second is argument from linguistic practice which is predicated on the incoherence of creativity attribution to entities that are not products of agency; the third is the modal argument which holds that in all possible world where objects appear spontaneously without underlying causative intentional agency, the objects in these worlds are not creative. These are indications that judging that some objects are creative is elliptical for judging that it is the result of some creative process which is a generative process that is non-trivially agential.[31] Monroe Beardsley makes an exception to artistic works. According to him "the value of a work of art consisted solely in the formal properties of the manifest work and the experience of those properties." What Beardsley highlights is that artistic works are valued based on the product (it seems aesthetically) not on the mode modes of production that generate them. To move beyond the product is to commit what has been termed intentional fallacy. Thus, appealing to an artist's intentions, designs, biography, or the context of presentation while appreciating and interpreting the work is simply for Beardsley fallacious. This is also the position of Wimsatt.[32] Aesthetic value according to Beardsley "is independent of the manner of production, even of whether the work was produced by an animal or by a computer or by a volcano or by a falling slop-bucket."[33] Like Stokes observes this is a case of synecdoche for the artistic value of creative work displaces creativity itself and this is why Beardsley moved from evaluation of aesthetics to anti-intentionalism in the whole creativity venture. Thus, one of his conclusions is that "The true locus of creativity is not the

[28] Gaut and Kieran, "Philosophising about Creativity," p.5

[29]Berys Gaut, "Creativity and Imagination" in B. Gaut and P. Livington (eds.) The Creation of Art, Cambridge: Cambridge University Press, 2003; D. Stokes, "Minimally Creative Thought," *Metaphilosophy*, 2011, 42:658-681; M. Kieran, "Creativity as a Virtue of Character," in E.S. Paul and S.B. Kaufman (eds.) *The Philosophy of Creativity*, New York: Oxford University Press, 2014

[30] D. Denneth, *Darwin's Dangerous Idea: Evolution and Meaning of Life*, London: Penguin, 1995)

[31] See Gaut and Kieran, "Philosophising about Creativity," p.21

[32] W. Wimsatt and M. Beardsley, "The Intentional Fallacy," *Sewanee Review* 54 (1946), 468-88,

[33] M. Beardsley, "On the Creation of Art," *Journal of Aesthetics and Art Criticism* 293 (1965), 291-304, p.302

genetic process prior to the work but the work itself as it lies in the experience of the beholder."[34] Yet it seems this anti-intentionalism is counter-intuitive. Stokes illustrates this in the following lines:

> We are standing before an early impressionist painting, say Monet's Impression, Sunrise. You say to me, among other things, that the work is genius, truly creative. I inquire why, that is, what makes it creative? You might, in your early response, manage to report features of the painting itself and how they are especially novel relative to the prior history of painting. So you might note the emphasis on light and shadow, the vivacity of the colours, the fact that the sun is of nearly the same luminance as the surrounding grey clouds. In justifying your attribution of creativity, however, it is likely that you would describe impressionist techniques. You are likely to mention the short, loose brushstrokes used; the use of pure (unmixed) paints side-by-side (so that the viewer does the mixing, as it were, to create the impressions of mixed colours), the placing of wet paint on wet paint. All of these features, among others, are typical of the process of impressionist painting; they are the innovations of the artistic movement. And that is just the point: in giving reasons for attributing creativity to Monet painting you have, quite naturally, invoked features of Monet's process of creation. And not only is this explanation natural, it or something like it is needed. Without mention of these features, your explanation would fall flat. But by invoking them, you have justified your attribution.[35]

Thus, all that went into the impression is necessary. Each event is as necessary as the other and all. In this wise Stokes writes, "without that decision and the corresponding action, and without that intention, among several other thoughts and actions, Monet would not have made the work he did." It goes without saying that the process view of creativity is more apt but it must be process understood not as a single event but process understood in terms event category of accomplishment. Stokes tries to make clarifications on the ontology of processes.[36] His was specific to artistic production but I do think that it applies to all forms of creative productions. And I think it is more integrative. This is in the understanding that creativity "is not an homogenous object, property or event. Nor is it wholly located at one time or other. …it involves both the culminating event and the stages that lead up to that event."[37] Creative processes are like accomplishments in that they process towards some end. Accordingly, "Without the end, the process is not a creative one; and without the process, there is no end."[38] The agency condition is tied to creativity. If originality and value are the only criteria then anything could be creative. Thus, tectonic movements of the earth's crust which could produce diamonds that are valuable and original in the sense of being saliently different from the rest of the diamond can be said to be creative. The product of tectonic movement may be beautiful, and stunning yet it is not creative. Rudolf Arhhein has argued of the tree as acting really and

[34] Ibid., p. 301
[35] Stokes, "Metaphysics of Creativity"
[36] See ibid.
[37] Ibid.
[38] Ibid.

genuinely creative "on grounds that they distribute their branches to make best use of light and that the resulting canopy 'represents the solution of a vital problem and what we experience as the beauty of the tree.'"[39] One wonders whether these could be said to be creative without any desire, belief, or intentionality. Creativity is always a purposeful action and so is agential. Creative works are things that are done and made and for which we praise their makers. The processes that generate them involve intentional agency and it is this process at least in part that is the reason that the agent is praised. The implication is that the process depends in some non-trivial way upon agency for we do not praise agents for processes that are out of their control. Stokes captures this intuition in the statement when he refers to the agency condition of creativity: "Some F is creative only if F counterfactually depends upon the agency of an agent A."[40]

Being creative is incompatible with doing something purely by luck. Thus, a person who had not the slightest intention of deviating from the established norms or habit but only wanted to reproduce strictly would not be considered creative. This is true even if the person manages to produce something novel and useful. This is only a matter of chance and serendipity. This is the reason that Gaut rejects Charles Goodyear's discovery of vulcanization, which discovery though original and valuable is simply the result of mechanically searching through all possible combinations available to him. It is in the same vein according to Gaut that chimp brushing a paint boisterously onto paper is not creative for the trainer would remove the paper at the point at which it is aesthetically pleasing, otherwise the chimp continues to paint to a mess. The chimp lacks the evaluative capacity to assess her work to know when to stop. That is if it had earlier thought about the end. This is indicative that creativity is conditioned also by the ability to exert autonomy in the course of the creative process by evaluating the qualities of a work and as needed changing its features or generative standards applied. Lack of autonomy gives rise to what Boden refers to as automatism in the creative process in which case input predetermines output. From here, Gaut concludes: "…the kinds of actions that are creative are ones that exhibit at least a relevant purpose (in not being purely accidental), some degree of understanding (not using merely mechanical search procedures), a degree of judgment (in how to apply a rule, if a rule is involved) and an evaluative ability directed to the task at hand." is a particular exercise of agency with requisite capacities.[41]

What this indicates is that serendipity is not creativity. This is not in any way to be blind to the fact that one can recognize and exploit possibilities afforded by serendipity and so one could as a result be creative. This is on the understanding that not all creative processes begin with a clear-cut pre-conceptualization and neat path of execution. Sometimes a flash of idea could come to one uninvited and the person puts such into creative use in such a way that the output could be ascribed to its creator and not a mere occurrence of circumstances. What this means is that before the outset of the flash, there is no conscious search for a solution to a problem. The solution that comes as a flash is only recognized as pertaining to a certain problem. One takes something to be solved at the moment one sees the solution to it.[42] Nevertheless outcomes that are entirely due to chance or serendipity are not considered as creative. This is because of

[39] Rudolf Arnheim, "What it means to be Creative," *British Journal of Aesthetics* 41.1 (2001) 24-5

[40] Stokes, "Metaphysics of Creativity."

[41]Gaut, "The Philosophy of Creativity" *Philosophy Compass* 5/12 (2010) pp.1040-1

[42] Maria Kronfeldner, "Explaining Creativity," in Berys Gaut & Matthew Kieran (eds.) *Routledge Handbook on Creativity and Philosophy*, New York: Routledge, 2018, p.215

the agential presupposition of creative productions and processes indicating that creative processes are actions and not mere byproducts of say luck or chance. This rejection of serendipity as creativity seems to fly in the face of the Platonic-Romantic view according to which a creative genius is acting spontaneously and unconsciously without plan or purpose. It must however be that the unconscious generation of ideas does not contradict the intention to create something new. The Romantic genius must have the intention to do so and awareness of doing so even if at some point it is virtually otherwise the person would be considered a sort of idea-generating machine but not a creative person.[43] What is being harped here is that creative processes are agential in the sense of being actions which themselves are essentially teleological, aiming at desired states of affairs. Not a few have countered this view and furnished an anti-teleological perspective. On the latter, it has been noted that many introspective reports stress that creative insights sometimes occur unbidden and spontaneously. Many in this category could acquiesce to the necessity of intention and teleology in cases of active creativity when creators engage in deliberate creative pursuits. This is not the case with passive creativity where creative ideas emerge without any specific pre-conceptualization or plan. In this case, one wonders whether such so-called passive creativity is creativity. Such passive creativity is simply a flash that could ignite the entire creative process but in itself is a mainstay in the process but not sufficient. Such flash requires to be perceived, evaluated, interpreted, applied, etc. and all are part of the creative process. It enters into what Thomas B. Ward et al. described as pre-inventive given that "they are not complete plans for some new product, tested solutions to vexing problems, or accurate answers to difficult puzzles." According to them, "…they may be an untested proposal or even a mere germ of an idea, but they hold some promise of yielding outcomes bearing the crucial birthmarks of creativity: originality and appropriateness."[44] The basic argument against teleology is presented by Gaut in a form of dilemma: "If one takes the means to an end, one has to know the end. But if a process of making something is creative, then one cannot know the end: for if one knows the end, one has already been creative…"[45] Gaut is insistent on the teleology perspective and argues that even given a completely determined goal, it is correct to talk about creativity. His way of dealing with this is to distinguish between creativity of means and creativity of end. For instance, in a building design by an architect though already in place, the structural engineer in the realization of the design may exhibit creativity. In addition, the creative process has most often partly indeterminate goals in such a way that creativity involves the clarification of the goal as well as the means to the goal. That is to say that "the process is teleological, and deliberation about achieving the goal consists not only in considering instrumental means (those actions that will realize it) but also constitutive means (more precise specifications of the end).[46]

Artificial Intelligence and Creativity: Is AI Really Creative?

Creativity has been attributed to Artificial Intelligence. This attribution is dependent on the product-view of creativity. This is because many of the AI outputs have shown novelty, evoke surprise, and are valuable, all of which are important characteristics of creativity. In the appreciation of the creativity of AI outputs the proponents have turned to the Turin Test in the determination of their creative value. Thus, given that in many cases, the computer-generated

[43] Klausen, "The Notion of Creativity Revisited: A Philosophical Perspective on Creative Research," p. 357

[44] Thomas B. Ward, Steven M. Smith and Ronald A. Finke, "Creative Cognition" p.191

[45] Gaut, "The Philosophy of Creativity," p.1041

[46] Ibid., p.1041

and human-generated artifacts are indistinguishable, the proponents of machine creativity consider these cases as valid computational creativity. In any case the question of whether passing a Turing Test has come under disputation. It is arguable however whether under full disclosure people would value AI-produced artifacts as much as they value human-generated artifacts. It seems that in the case of jokes, it is likely that they remain jokes not-withstanding whether they are produced by humans or by computers. It seems though that AI visual arts are not likely to be appreciated as much as humans are. This is perhaps because in the case of the former, there is no emotion and there is no meaning it intends to communicate. Certainly, this goes beyond the Turing Test which is based on closure not disclosure of the agent and so immediately points to some limitations in the Turing Test and more importantly shows that in the assessment of especially artworks, the production process is important and not just the outcome of the process. Incidentally one thing with all works concerning computational creativity is most often creativity defined by the result of a process not by the process itself. To answer the question of whether computer is genuinely creative, attention has to be paid to the process that yields the result.

Robert J. Marks[47] points that though computers do a great deal, they are limited by their being algorithms by their nature. He however notes that in terms of the ability of the computer, they are still restricted to algorithms. He notes that this is true even with quantum computers. The only thing is that "we're going to be doing them like lighting, but still, all of the stuff we could do with Turing's original machine." He further notes that probably the "biggest testable thing that computers will never be able to do is creativity." Computers according to him cannot think outside of the box like humans do. What computers do is simply reshuffle the status quo without going outside of the available data. According to him, "typical claims for computer-generated art, music or copywriting involve combining masses of similar material and producing many composites, the most comprehensible of which are chosen by the programmers for publication." None has been able to pass the Lovelace test which according to him searches for actual creativity. Boden in this instance argues that no human creativity ever arose from nothingness. According to her every creative work or creative idea is always preceded by a historical-cultural scheme, a fruit of cultural inheritance and lived experience. New thoughts are fruits of representations already in the mind and the more these representations, the greater the possibility of finding an unthinkable relation that leads to a creative idea. Thus, for her, "A creative idea is a novel and valuable combination of known ideas."[48]

Boden is right to a reasonable extent for no human creativity begins from zero. She criticizes the view that originality and spontaneity involve an opposition to causal determination. According to her, this view renders whatever explanation of creativity impossible. In this, the kind of independence that these two criteria incorporate is only partial. Partial because notwithstanding the originality and spontaneity that characterize creativity, it is always built

[47] Selection from "Bingecast: Robert J. Marks on the Limitations of Artificial Intelligence," a Discussion between Larry L. Linenschmidt of the Hill Country Institute and Walter Bradley Centre director Robert J. Marks. https://mindmatters.ai/2020/08/six-limitations-of-artificial-intelligence-as-we-know-it/

[48] M. Boden, *Artificial Intelligence and Natural Man*, New York: Basic Books,1987; Ramo Lopez de Mantaras, "Artificial Intelligence and the Arts: Toward Computational Creativity," https://www.bbvaopenmind.com/en/articles/artificial-intelligence-and-arts-toward-computational-creativity/

on already acquired knowledge of others and of the creative individual itself.[49] The reference to this partial independence does not derogate from the fact that genuine novelty must be unpredicted, unaccounted for by antecedents and available knowledge and so disconnected from the past as Carl R. Hausman would posit.[50] To talk of partial independence appears walking on a tight-rope of causal determination and what that entails for the proponents of a causal view of explanation sets a framework for ways of denying that there is anything new under the sun. For these, to be genuinely new, the novelty needs to transcend causal determination and so created ex nihilo. Kronfeldner observes that the underlying assumption is that creativity involves metaphysical freedom. The positive thing about this assumption of metaphysical freedom as a requirement for creativity is that it shows immediately that creativity is a human attribute for all and not just for a few geniuses for it would be very difficult to assume "that *metaphysically* some people are more and some people are less free, even if each human might be *practically* more or less free (to think or do this or that)."[51] Well the whole point of freedom from causal determination is that genuine novelty is impossible and thus positing the requirement of metaphysical freedom which is involved in creation ex nihilo is simply to show the impossibility given the human condition. Yet granted but without conceding that metaphysical freedom is possible, that is, in terms of pure freedom, Kronfeldner argues that metaphysical freedom is neither sufficient nor necessary for creativity. What is sufficient and necessary is rather what he calls psychological freedom. Besides, such a requirement of metaphysical freedom leads simply to the banalization of creativity and the existential burden of having to 'reinvent' the wheels. Every dime action qualifies as creativity assuming that all action is carried out from the standpoint of metaphysical (pure) freedom. Kronfeldner argues that common actions cannot be said to be original or spontaneous. Accordingly, "To establish originality and spontaneity, all that is required is an independence from very specific causal factors what she refers to as creative freedom and not from causal determination as such (metaphysical freedom). What is required as necessary and sufficient is simply creative freedom which entails originality in the sense of partial independence from the causal influence of an original (direct or via a model) and is opposed to copying or learning and spontaneity from the point of view of partial independence from causal influence of previously acquired knowledge and is opposed to routine and method.[52] It seems therefore that Computers lack this autonomy that is required for creative freedom to be present given that they are directly dependent on the algorithms made by the programmers and are governed by the goal set by the human creators.

The question of self-learning computers comes up as it appears to do something not foreseen by the programmers. The question is "Does that imply that there's learnability going on in there? Or is everything they're doing, even if it's not fully understood by the developer, still subject to the way that the developer set up the network?" Here Marks tries to make a distinction between surprise and creativity. Surprise cannot be confused with creativity. According to him "if the surprise is consequent to what the programmer decided to program, then it really isn't creativity. The program has just found one of those millions of solutions that

[49]Kronfeldner, "Explaining Creativity," p.217

[50] Carl R. Hausman, *A Discourse on Novelty and Creation*, Albany, NY: Sunny Press. Knoblilch, G., Ohlsson, S., Haider, H., and Rhenius, D., (1999) "Constraint Relaxation and Chunk Decomposition in Insight Problem Solving," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 25:1534-1555

[51] Kronfeldner, "Explaining Creativity," p.218

[52] Ibid., pp. 218-219

work really well in, possibly in a surprising manner." He seems to agree with the view of Larry L. Linenschmidt to the effect that computer is as good as its programmer. Thus "it's good at matching, it's good at putting things together, but not true creativity, what the entrepreneur Peter Thiel refers to the fact that a lot of people can take us from one to infinite but it's that zero to one that is creativity in the tech world, in the business world that sets apart." What is being harped here is that what defines human creativity is movement from zero to one and this is what computer cannot do as it always requires instructions. In this Marks writes "that creativity in business is never going to come from a computer. A computer would have never come up with the idea of Uber unless the programmer programmed it to look in a set of different things. That was something which was above and beyond the algorithmic." Creativity does not follow computational rules.[53] In this Marks doubts if computer program would ever pass the Lovelace test which is basically about testing their creativity. It says that "you have seen creativity if the computer program does something that can't be explained by the programmers." Marks notes that though one could get some surprising[54]results, yet that does not qualify as creativity. He gives as an example that "there was some surprising results that Alpha Go used when it played the master, but "surprising" doesn't count. It's still in the game of Go. If AlphaGo had gone on to do something like—let me make the point by exaggeration—give you investment advice or to forecast the weather without additional programming, that would be an example of AI creativity…" Besides they do not actually experience things, that is, qualia, and this limits actual understanding. This is the reason that AI achievements are narrowly focused.

Richard Oxenberg[55] argues that attributing intelligence to computer simply betrays the failure to understand the modus operandi of computer which even though it could mimic intelligence and sometimes in a sophisticated way, is nevertheless not intelligent. This is true even in the case of applications that could learn and continually better themselves. The bottom line is that it is still the product of human intelligence. He notes that even when the application becomes so complex that its next move cannot be foreseen, this is hardly an indication of intelligence but that "its creator had reached the limits of her own intelligence's ability to foresee all the implications of what she has created. The illusion of intelligence according to Oxenberg stems from what is referred to as branching. Branching entails the ability of computer to "execute different operations depending upon variations in input that creates for the observer the impression that the computer is making a 'decision' based on its 'experience.' Yet, this, itself, is programmed in such a way that the computer does not make any decision. It simply executes the next instruction as has been programmed based on the electronic situation it finds itself at any given moment. It follows therefore that artificial intelligence is not real intelligence. The complexity of some applications is simply additive in the sense that it is programmed to do more things under more conditions.

Ramo Lopez de Mantaras[56] following Margaret Boden, asserted that the question of whether AI is really creative comes from certain inveterate rejection of creativity in AI. According to Boden even if an artificially intelligent computer would be as creative as the Music guru Bach

[53]See https://mindmatters.ai/2019/03/creativity-does-not-follow-computational-rules accessed 16/11/2021

[54] "Bingecast: Robert J. Marks on the Limitations of Artificial Intelligence,"

[55] Richard Oxenberg in his "Why Computers are not intelligent: An Argument," *Political Animal Magazine*, 2017.

[56]De Mantaras, "Artificial Intelligence and the Arts: Towards Computational Creativity,"

or the great scientist Einstein, for many, it would just be apparently creative but not really creative. De Mantaras agrees with Boden citing two main reasons, namely the fact that computer programs lacking intentionality can only perform syntactic manipulation of symbols without any semantics; and our reluctance to give a place in our society to artificial intelligent agents. I do think that the second is a rephrasing of Boden's position rather than a reason for that. About the first, De Mantaras acknowledges that existing computer programs lack too many relevant causal connections for intentionality to happen. He however, expresses optimism that "perhaps future, possibly anthropomorphic, "embodied" artificial intelligence, that is, agents equipped not only with sophisticated software but also with different types of advanced sensors allowing them to interact with the environment, may have enough causal connections to give meaning to symbols and have intentionality."[57] About social rejection, he notes that it is simply a case of moral rejection, not scientific rejection. The reluctance to accept creativity in non-biological 'agents' is simply because they do not have a natural place in human society and so to integrate them would have social consequences. Thus, it is safer to simply say that computers appear to be intelligent, and creative instead of saying that they are. He in addition adds lack of consciousness as a third reason, though De Mantaras observes that computers would not be the first example of unconscious creators. The first example according to him is evolution. Quoting Stephen Jay Gould, he concludes, "If creation demands a visionary creator, then how does blind evolution manage to build such splendid new things as ourselves."[58] Well, explaining how awesome stuffs emerged without any rational agent remains a question evolutionism would have to grapple with unless the creation is founded on a rational creator. Predicating the denial of creativity and intelligence on conventionalism while it unfortunately disregards the problems surrounding artificial intelligence and human creativity as has been built up in this work is simply off the mark.

There is no doubt that the agential presupposition and purposefulness of creativity is lacking in computational creativity unless one speaks in terms of the human agency behind the making of artificial intelligence. The preceding sub-section has been able to highlight that agency, intentionality are essential parts of creativity, the reason why serendipity is not considered true creativity. To create is an intentional act and this presupposes an agent, a conscious being which the artificial intelligent system is not. Sometimes the impression is given that AI for instance can design, create, and write. This of course leaves people with the false impression that AI has agency and so can be conscious and intentional instead of being automated. AI is not a conscious entity but it is simply human beings using machine learning systems to do what they intend the machine to do. To say that for instance, the AI is writing, thinking, etc. masks the human agency behind certain processes while anthropomizing AI systems. This contributes to what Deborah G. Johnson and Mario Verdicchio refer to as sociotechnical blindness, namely, "blindness to all of the human actors involved and all of the decisions necessary to make AI systems…" For Johnson and Verdicchio, AI systems should be thought of as a sociotechnical ensemble which is a combination of artifacts, human behavior, social arrangements, and meaning. Agency has been ascribed to AI due to what has been referred to as a black box which explains that sometimes due to complexities of mechanisms, it is hard to explain how a result emerged. Such opacity has been adduced to signify creative independence from the human creators.[59] Marks notes that he has written computer programs that have element of surprise in them. According to him, sometimes he looks at what they do, and he is surprised that he could

[57] Ibid.
[58] S.J. Gould "Creating the Creators" *Discover magazine*, October 1996: 42-54
[59] Deborah G. Johnson and Mario Verdicchio, *Minds and Machines* 27 (4), 2017, pp.575-590.

exclaim, "Wow, look at what it's doing," but he notes that looking at the program he could say it was one of the solutions that he considered. He draws attention to the point that one of the ideas that is found in computer search is to lay out thousands be millions or billions of potential different solutions but one does not know what the effect of those solutions would be. In this case, Artificial Intelligence, lacking the fundaments of creativity such as agential autonomy and intentionality simply augments and optimizes existing human creativity.

Conclusion

There is no doubt that the product of artificial intelligence could be surprising yet this does not qualify as creativity. The argument here is that creativity is not just the property of a product but of a process that is a conscious intentional act and involves freedom and autonomy, intentionality and understanding, and imaginative thinking. Notwithstanding the controversies that surround many of these concepts, these concepts can hardly be rooted in materialism which is the building block of Artificial Intelligence. Behind the Artificial Intelligence lurks human intelligence and creativity which produces algorithms that govern AI's operation. Thus, notwithstanding that in many cases AI outputs scale through the Turin test, the output as proceeding purely from AI hardly qualifies as emanating from an intentional and purposeful agent marked by autonomy that is required for creative freedom, given the algorithmic nature of AI and in spite of the black box phenomenon. This is the reason that for the present researcher considers as apt the description of AI systems as socio-technical ensemble in order to cover both the human and machine factors in AI.