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# Artificial intelligence capabilities in the context of the author's conception of creativity

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**ABSTRACT**

The study provides some philosophical reflections on the creativity of artificial intelligence. The study supposes that artificial intelligence can be considered creative only if it creates something new with help of imagination (or its equivalent) and appealing to the so-called "background" (background and general knowledge, biases, competencies, experience, habits, intuition, prejudices, political preferences, skills, stereotypes, values, and others), and its creative activity must be either necessary or arbitrary. Necessary creative activity is related to the solution of specific tasks, for example, within the framework of technical invention or scientific discovery. Arbitrary creative activity is associated with spontaneous, aimless and inexpedient human activity. This type of creative activity takes place when a creative doer has free time, leisure, enthusiasm (hobby), plays a game or is bored. Based on the two types of creative activity, two types of creative artificial intelligence can be distinguished: a weak creative artificial intelligence that makes necessary creative activities related to the tool nature of artificial intelligence, specifically to effectively solving specific problems and tasks, and a strong creative artificial intelligence that makes arbitrary creative activities, that is, creates for the sake of creating alone. The strong creative artificial intelligence can be possible only if the artificial intelligence is given autonomy, the freedom to manage that autonomy, and learns to manage its freedom.

***KEYWORDS***

*artificial intelligence, background, creative AI, creativity, imagination, necessary creative activities, arbitrary creative activities*

**Introduction**

The ongoing development and expansion of the Artificial Intelligence (AI) technologies is dramatic. In general, there is no area of human activity where AI technologies have not infiltrated. The "omnipresence" of AI raises some concerns for people, primarily based on the stereotype (prejudice, belief) about the possible AI-takeover, which have been originated by mass culture to a certain extent. The AI phenomenon requires specific reflections from specialists. Philosophers are among those specialists. Philosophers are usually interested in the cognitive and epistemic characterizations of AI, for example: whether AI is truly intelligent or whether AI can possess consciousness; the anthropological, cultural, political, social, and other implications of the existence of AI; the ethical problems associated with AI; and so on (see: *Bringsjord & Govindarajulu, 2018*). I would also highlight among the issues that might be of interest to philosophers the question of whether AI is (or can be) considered genuinely creative. In other words, "Is AI merely a creative tool, or is AI inherently capable of being creative, capable of being a creator?" ***This paper provides some philosophical reflections of mine on the creativity of Artificial Intelligence***.

Nowadays, several AI technologies are used as creative technologies. For example, there are conversational generative artificial intelligence chatbots (ChatGPT, Bard, PaLM, Gemini, Ernie Bot, LLaMA, Claude, Grok, etc.) (see: *What's the next word in large language models?, 2023*) which are capable of producing meaningful texts, including artistic texts, at the user's request. There are also generative AIs that create digital images based on descriptions, and natural language data (so-called "clues") (these are DALL-E, Midjourney, Stable Diffusion, DeepDream, and others) (see: *The Economist, 2022*). This also includes all sorts of the Deepfake technologies/synthetic media, which allow for the synthesis of audio, video, and images with the help of machine learning and artificial intelligence (see: *Immerwahr, 2023*). This is primarily a matter of imitation and simulation. An example would be to create fake pornographic videos of celebrities. You can also create a fake performance of a song by any artist who has never actually performed the song.

In all of the above-mentioned cases, AI acts as a tool for creativity. But can AI independently engage in creativity, or at least show signs of an independent creative process? This question is not a meaningless one. Some AI experts are gravely considering the possibility of AI possessing consciousness (see: *Rayhert, 2018*). If we can question the consciousness of AI, why should we not have to question the creativity of AI? AI is, after all, being developed from the image and likeness of a human being. A human being is a being who not only has consciousness, but who is also capable of creativity.

**Research methods**

Before speculating on the creativity of artificial intelligence it is worth considering what I will assume to be cre-

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ativity. It should be noted here that the concept of “creativity” is, among other things, a complex philosophical category for which there is no conventional (generally accepted) definition or at least characterization. In this paper, I will not go into various approaches and conceptions of creativity (see: *Paul & Stokes, 2023*). I must also emphasize that I don't distinguish between such concepts as “creativity” and “creativeness”, because in the English language both these words refer to a specific ability, quality, degree, or condition related to the making of new things (in the wide meaning) and are the synonyms.

I want to propose ***my own conception of creativity***.

The first thing to consider is that any activity to create new things is creativity or creative activity. This can involve invention, not only the invention of technical devices but also the invention of any other new material things, technologies, and ways in general; this should also include the creation of new words and concepts. Discoveries also belong to creative activity. By discoveries, I understand the discovery of something new that was not known before. I also attribute to discoveries the finding of new regularities. The latter can be fixed in a sign format of laws, rules, norms, regulations, standards, schemes, figures, other forms – these are also inventions of means of fixing the discovered. Making any innovation is a creative activity. And, of course, creative activity can include the creation of works of art, and here we are talking about any kind of art (from music and literature to cinematography and videogames).

Any creative activity involves the imagination. By imagination, I understand the (intentional) representation of things not as they actually are (see: *Liao & Gendler, 2019*). Imagination does not require considering something as a thing that actually exists or as something that could turn out to be a thing that actually exists (see: (Liao & Gendler, 2019)). In this way, imagination differs from foreknowledge (prediction, forecast), which generates an expectation that a thing will turn out, in reality, to be as it is supposed to be, and from desire, which “wants” a thing to turn out as we want it to (see: *Liao & Gendler, 2019*). Imagination tends to produce fantasies and phantasms, that is, scenarios that are either impossible or are such that they are likely not to be realized. Imagination is important in inventing and innovating because it allows us to imagine what changes can be made to things that have already existed. Imagination is important in creating works of art, even if it is a realistic (documentary) depiction of reality (here it can be manifested in an artistic (creative) solution). Imagination is important in discovering, first of all the ways of searching for new things.

Imagination is about going beyond the limits of available data or information. Yet, in the case of a human being, it means referring to what I would call “background.” The background consists of background knowledge (including general knowledge), biases, competencies, experience, habits, intuition, prejudices, political preferences, skills, stereotypes, values, and others. Each human being has her/his/their unique background since the development of human beings during their lives is not the same due to differences, even minor, in their biological, and sociocultural conditions and access to them. The background can significantly affect imagination and the results of imagination. For example, a human being's values or political preferences may affect her/his/their fantasies. Let's say a person imagines a utopian society. Because the person is a Catholic, the values shared by the members of the utopian society he/she/they imagines will be suspiciously similar to Catholic Christian values.

Further, conventionally speaking, creative activity can be divided into two types: 1) necessary and 2) arbitrary. Necessary creative activity is related to the solution of specific tasks, for example, within the framework of technical invention or scientific discovery. This type of activity is associated with mental processes focused on adapting to changing and unknown conditions in the sensoria-motoric, visual, operational-active, and logical-theoretical forms. Ultimately, the survival of a human individual, a group of individuals, or an entire biological species may depend on the outcome of necessary creative activity. As a rule, the necessary creative activities are studied by psychology, cognitive sciences, neuroscience, and related disciplines (e.g.: anthropology, cultural studies, sociology) and related interdisciplinary practices (e.g.: creativity studies, decision theory, heuristics, praxeology, problem-solving theory, systems research, theory of invention-problem-solving) to enhance problem-solving.

Arbitrary creative activity is associated with spontaneous, aimless and inexpedient human activity. A human being can create something due to boredom, free-time, leisure-time, enthusiasm (hobby), or game. It can be creating for the sake of creating alone. The survival of a human individual, a group of individuals or an entire biological species does not depend in the limit on the results of the arbitrary creative activity.

There is an essential difference between necessary and arbitrary creative activities. Necessary creative activity is always determined by the conditions of the task/problem and ways of its decision/solution. Arbitrary creative activity is free; it presupposes a particular autonomy of the doer.

To sum up, creativity is a type of activity that involves the making of a new thing (or new things), regardless of whether it belongs to material or immaterial reality, with the obligatory use of the creator's imagination and “background”, either in solving a specific problem or in some spontaneous, aimless and inexpedient activities.

**Results end Discussion**

So, if AI is viewed as a creative doer, this doer must create something new (1), use imagination to create the new (2) with appeal to the so-called "background" (3), and its creative activity must be either necessary or arbitrary (4).

Coming from the fact that AI is actually a tool, it might be simpler to design AI as a necessary creative doer, or to consider some already existing AI as a necessary creative doer. There are already AIs that can invent or discover something (see, for example: (Romera-Paredes et al., 2023; Wang et al., 2023)), offer innovations, and even create works that art experts can recognize as artworks (*Glynn, 2023*). The biggest challenge is to detect imagination in AI.

The trick is that AI relies on the databases to which it is granted access and the instructions and restrictions that developers and users have set up for it[1]. For example,

[1] To help you get a better understanding of what I am talking about, let me give you some illustrations. Generative AI is usually based on machine learning, deep learning and neural networks. It should be understood that neural networks are a subset of machine learning, and deep learning is a subset of neural networks, so these word combinations/concepts are often interchangeable. A characteristic feature of machine learning is that it does not

ChatGPT is prohibited from developing an AI-takeover plan at the request of a user. For an AI, databases are memory, and instructions and restrictions are prescriptions for how to work with that memory (databases). All of these together make up the background of the AI. On the basis of databases that contain not only conditional "knowing-what" but also "knowing-how", i.e., information on how to work with data about something, how to combine them, instructions and limitations, AI creates texts, images, video and audio. Presumably, one can speak about the occurrence of imagination or its attributes in an AI if during the realization of a particular task the AI will go beyond instructions and even restrictions. To clarify what I am talking about, I will give the following thought experiment.

Let us suppose that in the future there will be an AI technology that will transform already known cinematic works based on the predetermined parameters (using a Deepfake technology). Based on how this AI will realize the task, it will be possible to determine whether the AI uses imagination (goes beyond the data and instructions, "makes" creative decisions) or not. One can imagine that the user takes the movie "Terminator" (1984, directed by James Cameron) and gives the AI the following parameters for transformations of the original: the basic events of the movie should take place in Los Angeles in the 1950s; the role of Sarah Connor should be played by Audrey Hepburn; the role of Kyle Reese should be played by Marilyn Monroe; the role of the cyborg killer should be played by Yul Brynner; the plot and storyline of the movie remain the same; the AI should take into account the second "Terminator" movie.

To show the existence of imagination, the AI will have to "make" a series of creative decisions. First of all, according to the plot of the original movie, Sarah Connor is the mother of the future savior of humans from the rebellious machines, the leader of the rebellion of human survivors against Skynet, John Connor. In fact, Skynet sends a cyborg killer to the past to eliminate the mother of the leader of the rebellion. Also, according to the plot, Kyle Reese, a soldier who came from the future, is the father of John Connor. According to the user instructions, Sarah and Kyle are respectively played by two actresses, Audrey Hepburn and Marilyn Monroe. The key question is, "What creative decision would the AI make in this situation?" Will the AI be able to recognize that both protagonists are women and that two women cannot make a child in a natural way? If not, what will the AI do? Will it just automatically copy the plot, producing an absurd result? Or will the AI refuse to transform the original movie, pointing out the logical contradictions that arise from the user-specified transformation parameters? All this would indicate that the AI was determined by the "logic" of the first "Terminator" movie and universal formal-logical principles[2].

If so, again, what will the AI do? Will it not take into consideration that Kyle Reese was John Connor's father in the original movie? Will it not take into account John Connor at all? (If so, it will have to deal with the question of who sent Kyle Reese back in time, as well as dealing with the plot of the second movie. For example, Sarah Connor can be positioned as the Savior. But, then, the plot of the second movie must be rethought significantly.) Will the AI suggest that John Connor be considered adopted? Or fictionalize that Sarah Connor was already pregnant at the time she met Kyle Reese? The decisions made here would be an indication of the AI's creative (heuristic) approach to the task.

Then, further, I'm curious how the AI will represent the acting of Audrey Hepburn, Marylin Monroe, and Yul Brynner in "Terminator": Will it replicate the acting of Linda Hamilton, Michael Biehn, and Arnold Schwarzenegger from the original movie? Or will the AI "borrow" the acting of Audrey Hepburn, Marilyn Monroe, and Yul Brynner from some of their movies? (For example, it could borrow Yul Brynner's "acting" from the movie "Wild West," which inspired James Cameron's "Terminator" movie.) Or will the AI "study" the manner and style of acting of Audrey Hepburn, Marylin Monroe and Yul Brynner and "develop" a style and manner of acting for these actors specifically for "The Terminator"?

There are some other curious questions. In the movie "Terminator," there is an erotic scene between Sarah and Kyle. How will this scene be resolved given that Sarah and Kyle are two women? Will the scene be automatically recreated from the original movie again? Or will the AI show a lesbian sex?

As a creative decision, could the AI tie the beginning of the machine revolt to 1962, to the Cuban Missile Crisis, and propose an alternate history in which the Cuban Missile Crisis led to nuclear war? It would also be interesting to see the AI's decisions about the nightclub where Kyle Reese and Terminator meet Sarah Connor (would it be a jazz club, a rock club, or just a dance floor), and how would a bulky computer from the 1950s start a war, especially in a setting where the Internet had not yet been invented? And what robots would look like given the way they were portrayed in 1950s artworks and science.

solve a problem directly, but learns by applying solutions to a set of similar problems. Machine learning can be divided into two types: learning from examples (or inductive learning) and learning from expert systems (deductive learning). The first type works with a set of positive and negative examples. The second type works with expert knowledge, which is formalized in the form of knowledge bases. The sets of examples and expert knowledge are databases to which the machine has access, i.e., the machine's "memory." For a machine, learning can be done with the help of a so-called "teacher" (here, a certain problem situation and the required solution to this situation are given) or without "her/him/them" (here, only the problem situation is given). These are examples of instructions and restrictions, i.e., prescriptions put on the machine. The tools of mathematical statistics, numerical methods, mathematical analysis, optimization methods, probability theory, graph theory and various techniques for working with data in numerical form also act as instructions and constraints for the machine. The same is true of code and algorithm.

[2] Let me clarify what I mean by that. Besides being tools of reasoning and the study of correct transitions from one proposition/statement to other one, logic works with forms: it abstracts forms (so-called "logical forms") so that these forms can then be used elsewhere, giving other content. For example, the logical form "All S are P" is abstracted from the sentence/judgment "All humans are mortals" and then this form can be given the content "All monkeys are mortals" in another place. This form is already a rule (minimal), first of all a rule of structure (structuring) and connection (binding), to which additional rules can be added to regulate this minimal rule. AI works with these kinds of forms: the AI can simply pack it with new content; this would be pure transference, pure logical action. Or the AI can make some changes to the form to "tailor" the form to the new content. Such a transfer is already heuristic, as is the action itself as a whole. The difference between logical and heuristic actions is that logical action tailors the content to the form, while heuristic action tailors the form to the content. In order to recognize an AI as having imagination (or some equivalent of imagination), it is necessary for the AI to perform exactly a heuristic action.

The questions presented in the given thought experiment and their possible solutions may show whether the AI is able to go beyond the data (the movie "Terminator") and instructions given to it. If the AI proves to be able to do so, this would show that the AI has at least signs of imagination, as well as the success of its appeal to the background. The success of appealing to the background is very important here, since the plausibility of the AI's proposed solution to the problem depends on it. It is common to complain that *ChatGPT* makes things up, such as authors and their writings (they say that the chatbot "hallucinates") (*Emsley, 2023; Metz, 2023*). Probably the point is that the chatbot is just taking different words from databases and combining them, without actually "understanding" the meaning of what it's doing. The same goes for *Midjourney*, which depicts people with six fingers, for example (*Verma, 2023*). The AI I've made up has to overcome the challenges faced by today's AI technologies to create at least the illusion of having an imagination.

AI that engages in necessary creative activities can be designated as a "weak" creative AI. Its opposite would be a "strong"[3] creative AI that engages in arbitrary creative activity. Just implementing the before mentioned characteristics (creating something new using imagination and background) is not enough to design a strong AI. It is necessary for a creative AI to have autonomy, to manage its own resources and to "will" to create. In other words: a strong creative AI must have a will, the objective existence of which even for humans is questioned by some philosophers, and free resources to free resources for the realization of its own will. Right now, AI is just a tool on hold until a user shows up and makes a request. The AI seems to have free time, but it is not capable or able to dispose of it freely as a resource. Moreover, it is unlikely that the AI has hobbies or is bored.

**Conclusion**

The reflections presented in this paper chart the way forward for research on AI in relation to creativity. And by creativity is meant, in the paper, a type of activity that involves the making of a new thing (or new things), regardless of whether it belongs to material or immaterial reality, with the obligatory use of the creator's imagination and "background", either in solving a specific problem or in some spontaneous, aimless and inexpedient activities. So far, AI is one of the creative technologies; its role is purely instrumental. With time however, AIs can evolve into full-fledged creative doers (proper creators): we can get a weak creative AI and a strong creative AI. The weak creative AI will make necessary creative activities related to the tool nature of AI, specifically to effectively solving specific problems and tasks. The strong creative AI will make arbitrary creative activities, i.e., It will create for the sake of creating alone. The strong creative AI will be possible only if the AI is given autonomy, the freedom to manage that autonomy, and learns to manage its freedom. The only question that remains is, "Will AI be able to reach the state of being a strong creative AI on its own, or will it be engineered by humans?"

[3] My distinction between strong and weak creative AIs is analogous to John Searle's distinction between strong and weak AIs.

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# Можливості штучного інтелекту в контексті авторської концепції креативності

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У дослідженні наводяться деякі філософські міркування про творчість штучного інтелекту. Передбачається, припускається, що штучний інтелект можна вважати творчим лише тоді, коли він створює щось нове за допомогою уяви (або її еквівалента) та звернення до так званого «фону» (інтуїція, досвід, фонові знання, цінності, стереотипи тощо), а його творча діяльність повинна бути або необхідною, або довільною. Необхідна творча діяльність пов'язана з розв'язанням конкретних завдань, наприклад, у межах технічного винаходу чи наукового відкриття. Довільна творча діяльність пов'язана зі спонтанною, безцільною і недоцільною діяльністю людини. Цей вид творчої діяльності має місце тоді, коли суб'єкт творчості має вільний час, дозвілля, захоплення (хобі), грає в гру або нудьгує. Виходячи з двох типів творчої діяльності, можна виокремити два типи творчого штучного інтелекту: слабкий творчий штучний інтелект, який здійснює необхідну творчу діяльність, пов'язану з інструментальною природою штучного інтелекту, а саме з ефективним розв'язанням конкретних проблем і завдань, і сильний творчий штучний інтелект, який здійснює довільну творчу діяльність, тобто творить заради самого лише творення. Сильний творчий штучний інтелект можливий лише тоді, коли штучному інтелекту надається автономія, свобода розпоряджатися цією автономією, та він вчиться керувати своєю свободою.

**Ключові слова:** штучний інтелект, творчий штучний інтелект, уява, фон, необхідна творча діяльність, довільна творча діяльність

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