

Johann Lauer

Philosophy of generative artificial intelligence (AI).

Theoretical limitations and possibilities,
practical benefits and threats of large language models

Abstract

In my view, the role of *philosophy* and of *philosophers* in relation to generative AI should be to reflect, in a Kantian-Socratic way, i.e. critically and skeptically, on the following areas of work: first, the philosophical (axiological, epistemological, methodological, ontological) foundations should be established. Second, the theoretical limits and possibilities as well as the practical benefits and threats should be identified. Third, on the basis of the knowledge thus gained, both analytical-theoretical and normative-practical proposals for the further development of this technology should be presented. The transfer of fundamental philosophical concepts from the field of philosophy of science to generative AI makes it possible to fulfill these tasks.

Generative AI is an extremely powerful tool that can be compared to a *digital librarian* who can provide information about all the texts available to him. However, it has only a *narrow intelligence* because it cannot understand texts. Furthermore, generative AI lacks the means to ensure the *transparency* and *reliability* of the answers. *Scientists* have methodologies to understand texts, check the elaboration of results and evaluate the quality of the results. There are qualitative-interpretative methodologies, quantitative causal analyses and practical (normative, pragmatic and technical) methodologies. These methodological tools could help to develop generative AI into a *digital scholar* in the future.

A comparison with *human intelligence* shows what is still missing for an *AI robot* to become an acting artificial expert that can solve problems like a human: perception, consciousness, self-awareness and self-knowledge. The realization of a general, human-like or *strong artificial intelligence* (AGI) would be an important milestone. Only then should our descendants discuss the dangers of *superintelligence* (ASI).



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Introduction: starting points, questions and approach

In my view, the role of *philosophy* and of *philosophers* in relation to generative AI should be to reflect, in a Kantian-Socratic way, i.e. critically and skeptically, on the following areas of work: first, the philosophical (axiological, epistemological, methodological, ontological) foundations should be established. Second, the theoretical limits and possibilities as well as the practical benefits and threats should be identified. Third, on the basis of the knowledge thus gained, both analytical-theoretical and normative-practical proposals for the further development of this technology should be presented. The transfer of fundamental philosophical concepts from the field of philosophy of science to generative AI makes it possible to fulfill these tasks.

Since the 19th century, the *scientification* of life as a whole has progressed extremely far. Science is the gold standard when it comes to knowing or changing the world. The process of scientification has been driven forward for decades not only by science itself, but also by developments within artificial intelligence. Since November 2022, generative AI has been the latest innovation within AI, further supporting and accelerating this development.

1. What are the *philosophical foundations* (axiological, epistemic, methodological and ontological) of generative AI?
2. What theoretical *possibilities* and practical *benefits* does generative AI offer? What are the theoretical *limitations* and practical *threats* of generative AI?
3. How can large language models evolve from *narrow* to *strong AI*? How can generative AI be further developed using existing scientific methodologies to produce tailored *AI assistants*? In other words, how can the current *digital librarian* evolve into a *digital scholar* in the future?
4. What else is needed to create an *acting artificial expert* or *AI robot* with humanlike artificial general intelligence (AGI)? Is it possible that further development could even lead to a *singularity*, an artificial superintelligence (ASI) that subjugates all of humanity?



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The above tasks of philosophy are addressed as follows. In order to explain the philosophical foundations of generative AI, i.e. to fulfill the first task of philosophy, I have applied basic philosophical questions (axiological, epistemological, methodological and ontological) from the field of *philosophy of science* to generative AI. In my view, *big data* is the subject or the *ontological* foundation, *algorithms* are the *methodology*, and *training* is done on the basis of *epistemological* and *axiological* foundations. These analyses make it possible to gain an idea of the theoretical *limits* and *possibilities* as well as the practical *benefits* and *threats* of generative AI, i.e. to tackle the second task of philosophy.

Generative AI is a powerful tool that can usually provide high-quality answers to human requests, questions and clues, called *prompts*. It calculates the statistically most likely word combinations for the input given in the prompt. Generative AI can be compared to a *digital librarian* that, like a search engine, can provide information about all the texts available to it. Generative AI can also generate new texts, summarize large amounts of text, improve the grammar and style of texts, and translate them into different languages. In addition, the large language models (LLMs) can also be used to generate software code, and LLMs can also be applied to audios, images and videos. In the following, only the theoretical possibilities and limitations, the practical benefits and threats associated with the use of language will be discussed.

Despite its excellent achievements, generative AI has only *narrow intelligence* because it cannot understand texts. Furthermore, generative AI lacks the means to ensure the *transparency* and *reliability* of the answers. Scientists have methods to understand texts, check the elaboration of results and evaluate the quality of the results. There are qualitative-interpretative methodologies, quantitative causal analyses and practical (normative, pragmatic and technical) methodologies. These methodological tools could help to develop generative AI into a *digital scholar* in the future. Thus, the third task of philosophy would be fulfilled.



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A comparison of *human intelligence* with generative AI serves to assess the extent to which the goal of general human intelligence has been achieved and whether *superintelligence* is likely. This comparison shows what is still missing for an *AI robot* to become an acting *artificial expert* that can solve problems like a human: perception, consciousness, self-awareness and self-knowledge. The realization of a general, human-like or *strong artificial intelligence* (AGI) would be an important milestone. Only then should our descendants discuss the dangers of *artificial superintelligence* (ASI). The article ends with a conclusion in which the importance of generative AI for professional and private life is briefly shown.¹

¹ This is a journalistic article, so it does not contain any scientific references. The bibliography of the people mentioned in the article can be found online at lauer.biz/ai-references.htm. There you will also find further references to diagrams that briefly explain the philosophical principles developed by the author. There are also links to important sites that provide AI tools or deal with the topic of generative AI.



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Philosophical foundations of science compared to the foundations of generative AI

Theoretical limits and possibilities, practical benefits and threats of generative AI

From digital librarian to digital scholar: advancing generative AI using existing scientific methodologies

Human intelligence versus generative AI, humans versus AI robots



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Conclusion: comparing scientific and human intelligence with generative AI

This article compared scientific and human intelligence with generative AI. First, the philosophical foundations of generative AI were explained. The article then discussed to what extent generative AI has come closer to the goal of creating a general AI that can also generate rational knowledge. It was found that generative AI is significantly inferior when compared to both scientific and human intelligence.

A report by Sir James Lighthill for the British Parliament in 1973 came to a devastating conclusion for AI research. This was the start of the so-called AI winter, which led to the withdrawal of public funding and a decline in AI research. Lighthill *failed* to recognize the strength of narrow AI. Over the last five decades, the performance of *narrow AI* in particular has improved enormously, as generative AI has recently demonstrated. The great goal of general *human AI* is still a long way off. *Superintelligence* was and remains science fiction.

Philosophy as common sense

The term “philosophy” has multiple meanings. In a broader sense, philosophy encompasses common sense, which includes both a theoretical worldview and ideas about practical world change. In the context of intelligence and solving problems using AI, this includes all aspects that fall under intelligence as well as the possible applications of AI technology.

Whether we want it or not, we will be confronted with generative AI in our professional and private lives in the future. Therefore, everyone should study these tools to understand the practical benefits and threats. Everyone should design their philosophy of generative AI to shape their perspective on how to handle and use the new technology. The main advantages include the search for content, which is fundamentally redefined and expanded by generative AI. The greatest dangers include the enormous possibilities of disinformation and uncritical techno-solutionism, i.e. blind trust in technology.



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School philosophy and philosophy of science

Philosophers trained at universities use the term “philosophy” in a much narrower sense. Since the 20th century, philosophy has also been practiced as a science that examines the foundations of scientific research, for example in the philosophy of science.

The first of the above tasks of philosophy has been addressed as follows. In order to explain the philosophical foundations of generative AI, I applied fundamental philosophical questions (axiological, epistemological, methodological and ontological) from the field of philosophy of science to generative AI. In my opinion, big data constitutes the subject matter or ontological foundation of generative AI, algorithms constitute the methodology, and training is done on the basis of epistemic and axiological foundations. These analyses make it possible to look at the theoretical limits and possibilities as well as the practical benefits and threats of generative AI, i.e. to tackle the second task of philosophy.

Generative AI is an extremely powerful tool that can be compared to a digital *librarian* who can provide information about all texts available to him. He can also generate new texts, summarize large amounts of text, improve texts grammatically and stylistically, and translate them into different languages. Nevertheless, generative AI only has *narrow intelligence* (ANI) because, firstly, it only uses quantitative methods and therefore cannot *understand* texts from the outset. Secondly, generative AI lacks the means to ensure the *reliability* of the answers. The ideal of artificial intelligence as a universal problem solver has long since faded into the background.

Scientists have methodologies to understand texts, to check the production of results and to evaluate the quality of the results. There are qualitative-interpretive methodologies, quantitative causal analyses and practical methodologies. Generative AI’s quantitative methodology enables correct *syntax* but not *semantics*. Generative AI does not understand its own text or the text entered by humans. It simply calculates the statistically most likely word combinations for the input given in the prompt, without



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being able to interpret or understand it. In contrast, scientists can understand both their own texts and those generated by AI.

In the future, by adopting additional scientific methodologies, generative AI could become a digital *scholar* who also understands texts and thus masters' semantics. The philosophy of science can therefore make an enormous contribution to the further development of generative AI. The third task of philosophy can be addressed in this way.

A comparison with *human intelligence* shows what is missing for an *AI robot* to become an *acting artificial Expert* that can solve problems like a human: perception, consciousness, self-awareness and self-knowledge. The realization of general, *human-like* or *strong artificial intelligence* (AGI) is a yet unreached milestone. The comparison between generative AI and human intelligence reveals that generative AI is still far from achieving artificial general intelligence (AGI) or human-level intelligence (HLI). Fundamentally, machines cannot achieve human intelligence. AI researchers probably cannot even teach machines perception, let alone consciousness, self-awareness and self-knowledge. Therefore, the Moravec paradox, formulated in 1988, still holds true today. Computers are better than adults at solving abstract tasks, but they still cannot match the performance of children when it comes to perception and movement. Therefore, concerns about machines taking over are unfounded.

HHH philosophy: create hype through hysteria and hubris

The scientific-philosophical investigations carried out above are based on a Kantian-Socratic approach and habitus that questions everything that is self-evident. The limits and possibilities of a subject are examined using Occam's razor. However, holistic perspectives are often overlooked. For centuries, sophists have attempted to fill this gap with their holistic approaches, claiming to know the underlying principles that hold the world together and how to create paradise on earth.



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Apocalyptists, gurus and marketing experts who pose as philosophers try to stir up fears and problems through *hysteria*. They often discuss topics such as the future dominance of machines or the end of the world, and then offer supposed solutions to these problems. The *hubris* of these offers is nonchalantly glossed over. These modern sophists create *hypes*, which serves as a business model for them and allows them to earn a good living. This started when the computer scientist John McCarthy used the artificial term AI as part of a grant application for a research project in 1955. The grant enabled the first conference on AI to be held in the summer of 1956 at Dartmouth College in Hanover, New Hampshire. AI established itself as a very powerful, marketing-friendly term of art. Today many scientists and companies are not just victims of this hype created by this artificial term, but also themselves fuel it to mobilize funds for their own products, projects and research. The lofty promises, such as the creation of an AGI or superintelligence, have not yet been fulfilled.

However, the film industry has also contributed significantly to the hype around AI by depicting the possibility of humanity being subjugated by machines with superintelligence. Ethical, social and political implications are outlined that go far beyond what is technologically possible.

Cognitive research studies human intelligence as well as the intelligence of other living beings. AI research includes quantum mechanical, chemical, and biological experiments that aim to recreate perception, consciousness, self-awareness and self-knowledge, or create new living beings. Some AI researchers like Ralf Otte believe that it will take decades before significant breakthroughs are achieved here. Only when such breakthroughs are achieved should our descendants discuss the dangers of a superintelligence (ASI) that has far more advanced thinking and problem-solving abilities than any human and could potentially dominate humanity.



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