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Volume 4, numéro 2, automne 2024

URI : <https://id.erudit.org/iderudit/1115405ar>

DOI : <https://doi.org/10.7202/1115405ar>

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Éditeur(s)

New Explorations Association

ISSN

2563-3198 (numérique)

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Citer ce document

Logan, R. (2024). What is AI? An Interesting Question and a Probe. *New Explorations*, 4(2). <https://doi.org/10.7202/1115405ar>

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What is AI? An Interesting Question and a Probe

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Will Douglas Heaven (2024) formulated the interesting question: What is AI? in the July 10, 2024 issue of the MIT Technology Review. In this probe I try to answer the question he raised, namely, what is AI?

Who coined the term artificial intelligence?

The term artificial intelligence was first coined by John McCarthy in 1956 when he held the first academic conference on the subject. But the journey to understand if machines can truly think began much before that. In Vannevar Bush's (1945) seminal work *As We May Think* he proposed a system which amplifies people's own knowledge and understanding. Five years later Alan Turing (1950) wrote a paper on the notion of machines being able to simulate human beings and the ability to do intelligent things, such as play chess (<https://courses.cs.washington.edu/courses/csep590/06au/projects/history-ai.pdf>, accessed July 17, 2024).

In the articles of Bush and Turing they never claimed that computers had intelligence, artificial or otherwise. I would claim that computer-based artificial intelligent or AI devices do not have intelligence, artificial or otherwise. Rather it is the creators of the AI device, the programmers and the users that have intelligence. They make use of computing technology and the information those computers can access to address the problems that they formulate and wish to explore. Computers, AI devices, or robots have no desires as they have no needs and therefore they have no intelligence. Intelligence is the capacity to achieve goals that one desires and to have desires requires having emotions. Computers are emotionally bankrupt (Braga and Logan 2017) and therefore have no desires or goals and therefore have no intelligence.

There is no reward for an AI device when they solve a problem or more accurately when a human uses them to solve a problem. There is nothing to motivate them. They have no emotions, no desires and no goals. They operate at the will of their programmers/users. Rather it is users of the AI device that possess the intelligence. They establish the goals of their research, formulate the questions to be explored and set the agenda for their computer-based AI devices. The joy of solving a problem, discovering new knowledge or new relationships or patterns of existing knowledge using computer technology is possessed by the human users who set the goals of the AI technology they use. The AI devices themselves do not set the agenda, formulate the goals of the research that they are deployed to facilitate; nor do they experience any pleasure, joy or sense of accomplishment of what they facilitate. The notion that they would take over and control their users is purely the stuff of science fiction as they have no desires. There is nothing they wish to achieve and certainly no motivation. In order to set goals, to have desires one must have emotions. We know that those unfortunate humans who have a very low level of emotions are not very curious or very creative and certainly do not engage in research.

The idea that an AI device would wake up one day and say I would like to solve a particular problem or say I would like to control my programmers is purely the stuff of science fiction. Rather, it is the users of the computer technology that formulate the problems that are addressed and use the computer technology and the information that the computers access and organize to address the problems that

they, the humans, have formulated. The intelligence is not possessed by the computers but by the programmer/users of the AI device who are also the ones who formulate the questions to be addressed or researched using the computing power of their AI devices.

The most creative part of the use of intelligence is not solving a problem but formulating it as well as organizing all the information pertinent to addressing it. Formulating a problem entails both analytic skills as well as the use of curiosity which is a combination of intellectual and emotional motivations which only a human can achieve. As a computer can never experience emotions, desires or curiosity it cannot formulate a problem to be explored but it can be used by its human users to address the problems that they the human users of AI technology formulate. The so-called artificial intelligence device is merely a tool used by the human user to address problems that they, the human users, have formulated. And in fact, as Marshall McLuhan (1964) suggested in his book *Understanding Media: Extensions of Man*, those AI devices like all other forms of technology are merely extensions of their human users.

Are Writing Systems and Numerical Notations a Form of Artificial Intelligence?

Writing systems and numerical notations allowed humans to create new forms of knowledge and new ways to organize human culture paralleling the way computers and AI devices have done the same for their human users in our times. In particular, the use of notational systems gave rise to

- physical and biological sciences;
- mathematics and the notion of zero (sunya, invented by the mathematicians of India);
- philosophy (particularly analytic philosophy of the Greeks but also the Eastern philosophical traditions as well);
- legal codes (Ur-Nammu and Hammurabi being the earliest);
- ethical monotheism (Judaism and the Hebrew formulation of the Ten Commandments, Christianity, and Mohammedanism); the Asian ethical religions of Hinduism, Buddhism, Taoism, Confucianism, Shintoism;
- the social sciences (psychology, anthropology, sociology, psychology, political science, and economics).

Given the plethora of human cultural achievements that the use of writing systems and numerical notations gave rise to, can we not consider them as a form of artificial intelligence? I think not. Just as the essential intelligence in this partnership of the human user and the computer/AI device is that of the human and not that of the technological tool, the same is true of the human user of writing systems and mathematical notations. An essay written with a script is the intelligence of the author not the writing system used to express the author's thought. The alphabet was a useful tool that led to an analytic/philosophical form of writing with the Greeks and a theological/moralistic form of writing with the Hebrews but the intelligence was that of the philosophers and theologian and not that of the alphabetic writing system they used (McLuhan and Logan 1977 and Logan 2004).

How absurd would it be if one were to claim that numerals based on Arabic numbers or writing systems such as the phonetic alphabet were a form of artificial intelligence? The only possible way to think of a book or more generally the literature as a form of artificial intelligence is that through their organization of information they allow their users to increase their knowledge and to a certain extent their

intelligence and that they provide information that a researcher finds useful to solve the problems that they, the researchers, have formulated.

It is the formulation of the questions that the information contained in the books, encyclopedias or the literature in general could help address that is the essential form of intelligence. The encyclopedia, books or literature can be thought of as a form of print based artificial intelligence, if you will, but it is a bit of a stretch. The technology of computers created vastly larger collections of information and automated ways of accessing that information and relating them to the problems formulated by their users in what we call AI or artificial intelligence. No one ever considered a print-based encyclopedia or the literature to have any intelligence. The problems it (i.e. the information in the literature) helped to solve were formulated by their human users. An AI device basically operates as an electronic encyclopedia or the electronic form of the literature which in addition automates the accessing of the pertinent information to solve the problems formulated by their human users.

What is unique about the AI device and what allows its human investigators to explore questions that hitherto before were not possible is that the amount of information/data that the computers can now access, organize and analyze is many orders of magnitude greater than that which human investigators could analyze using conventional non-automated techniques of data analysis. There is no more intelligence in the data organized by computerized AI devices than the data organized by conventional pre-computer techniques. The increase in intelligence is that of the developers of the AI devices to automate techniques of data analysis. As a result using AI devices one is able to increase by many orders of magnitude the amount of data that can be analyzed. This allows the users of AI to solve problems that hitherto were unimaginable. The intelligence is in those AI developers that created the AI technology and not in the AI devices themselves that are not even aware of the successes their users achieved using them nor are they aware of their own existence. After all, one sign of intelligence, is to be aware of one's own existence which is not the case of an AI device, but to a certain degree is true of all living organisms. A bacterium has more intelligence than an AI device, which after all is nothing more than a tool; more sophisticated than a hammer but still a tool unaware of its own existence.

Just as computers and AI devices help their users solve problems that they, the users of these devices, formulate; writing systems and numerals help their users solve problems that they, the users of these notational systems, formulate. No one would claim, however, that writing systems and numerals are a form of artificial intelligence.

Neither the print based literature nor the computer technology contain intelligence. The intelligence is that of the human users of the literature or computer devices to access information to answer question that they, the humans, have formulated.

To what extent could numerals or writing systems be considered a form of artificial intelligence? Encyclopedias and books using a writing system could in a way be considered as forms of artificial intelligence in that through their organization of information they allow their users to increase their intelligence. It is the formulation of the questions that the information of these encyclopedias or literature could address, is the essential form of intelligence, and therefore, the encyclopedia/literature is a form of print based artificial intelligence if you are willing to stretch the definition of intelligence. The technology of computers created vastly larger collections of information and automated ways of accessing that information and relating them to the problems formulated by their users in what we call AI or artificial intelligence. No one ever considered a print-based encyclopedia to have any intelligence. The problems it (the encyclopedia/literature) helped solve were formulated by their users and the intelligence of those users. The same is true of the information and knowledge organized using computers which are many orders of magnitude greater than anything organized by the print based literature. Both the literature and the computer technology do not contain intelligence. The intelligence is that of the users of the literature and/or computer technology who use the literature or the computer technology to answer question that they, their human users, formulate.

Conclusion

So the answer to the question “what is AI? that I posed in the title of this probe is that an AI device is not artificial “intelligence” but rather it is a tool deployed by a human operator to solve problems formulated by that user making use of the computer’s capacity and programmed by its user, to access and organize information that can be obtained online on the Internet or fed into the computer. That being said I do not suggest that we drop the term AI, which is embedded in our language but I do suggest that it is better to use the term AI rather than artificial intelligence keeping in mind that AI is, in fact, a computer device and a tool to facilitate problem solving and not a form of intelligence that is anything like human intelligence. In fact to suggest that AI is a form of intelligence is to demean human intelligence.

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