Artificial Intelligence: Thinking and Acting Otherwise

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Abstract

Artificial intelligence could overwhelm human intelligence. Unless the association of their complementarity is a promising imperative.

Keywords: *Natural Obsolescence; Robot in Space; Thought in Equation*

Introduction

Unlike human intelligence, which results from living matter, artificial intelligence results from an artifact[1] directed by an algorithm [1].

Given that artificial intelligence performs a role more and more effective beside human intelligence, is artificial intelligence able to replace human intelligence? The definitions of the two concepts and their fundamental differences are going to help leading this analysis.

The subject is highly conducive to conjectures, all the more nobody knows what will happen in the coming years.

A definition of intelligence

Many people claim that humans have the highest level of intelligence compared to other species, although most humans are unable to define the word intelligence, although human behavior is quite often far from behaving intelligently, although other species are not supposed to behave according to human standards that are selected by humans who monopolize the two roles: player and referee, judge and party!

With reference to the current use of the word and in a broad sense, the intelligence is what allows a system to develop a positive behaviour. In other words, an organized system, such as a computer, a robot or a brain, is intelligent when it is able to behave positively. This definition is deliberately imprecise and open, so we can describe the sensitive intelligence and talk about artificial intelligence. In addition, some elements borrowed from the knowledge about time and space, will provide valuable clarifications.

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[1]Artifact: from Latin "artis factum", made from art, from a know-how.

Sensitive intelligence

Sensitive intelligence is an exclusive property of living organisms. Broadly speaking, it can be broken down into gradually progressive levels:

- Interestedness about the surrounding environment; lack of concern is obviously a negative sign.
- Ability to appropriately self organize in relation to the surrounding environment.
- Desire to learn: Young gulls (goélands) learn how to hover straight against the wind, unlike a sailing dinghy which take support on the water; a technical know-how that we are enable to explain.
- Ability for learning, favorable provisions for acquiring skill, knowledge, build tool, use meta tool. It can be observed from mice, monks, birds. For example, birds move according to a three-dimensional view of their surrounding environment; we move according to only two dimensions. It would certainly be interesting to investigate about the consequences of this disadvantage.
- Informed behavior, including empathy, inter-species empathy.
- Critical analysis of what is learned, of behaviors, ethical concerns, epistemology.

Example with bacteria: they reproduce by scissiparity; one mother gives two daughters, each daughter becomes a mother who turns into two daughters, etc. When bacteria are deprived of sugar, they reduce their reproduction rate by a factor two [2]: in this way, it leads to the preservation of the bacterial line. One can also observe that bacteria were there long before humans[2] and they will always be there long after human have disappeared: a behavior under the protection of a crypto[3] intelligence. Therefore, bacteria are smartly organized, however we use to assert that they don't think and that their knowledge is negligible compared to that of humans. This is questionable because human thought is not reliable and beliefs often take over knowledge. This is also questionable because the artificial intelligence did not reach the bacterial level of intelligence yet.

Human intelligence

Now that we know we don't have the monopoly of intelligence, in the following the comparison of artificial intelligence shall be limited to human intelligence.

For the German theorist Friedrich Engels (1820-1895) "The mind is the highest product of the matter" [3]. Engels should not assert that it is the highest product because we can easily imagine more sophisticated organization in another place in the Universe: the organization of an atomic nucleus is much more complex than that of a brain. Engels also forgets to mention the energy[4] without which the electro-encephalogram is flat: the brain is dead.

Ultimately, the brain is a complex organization of matter and energy, and the intelligence results partly from this innate organization and partly from the acquired.

The intelligence emanates from a living principle. It must be reminded that the functioning of the brain is described by the laws of biology, psychology, psychiatry and psychoanalysis; but the brain does not obey these laws. Laws describe, they don't prescribe.

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[2]The prokaryotic bacteria appeared more than 3.6 billion years ago.

[3]From Greek "kriptos": encrypted, hidden.

[4]According to the Special Relativity developed in 1906 by the German physicist Albert Einstein (1879-1955), matter and energy are equivalent. It must be emphasized that it is a mathematical equivalence: given that their physical properties are different, they are not physically equivalent. Therefore, matter and energy must not been confused.

Artificial intelligence

However, the word "intelligence" is a deceptive intruder, the expression "artificial intelligence" is now part of the common language.

The artificial intelligence results from artifacts which imply electric connections driven by binary instructions of algorhythms. A robot looking like a man, climbing a staircase, saying "how are you" when you say "hello", is not intelligent in the strict meaning of the word.

Studies of connections between artifact and living matter are currently underway. For example, interpose a robot between a brain and the muscle of an arm starts giving results. It raises major questionings about the education of the brain and the nature of the interface between the brain and the robot. The interface designates the contact area between two systems described by laws that are different.

Anyway, these artifacts are not imitations of human brain; the organization of a brain is much more complex and the way the artificial intelligence performs is drastically different from that of living intelligence. Indeed the brain has about 90 billion neurons, each being interconnected with a few thousand neurons, which makes about 100,000 billion connections. In addition, the complexity is potentiated by specific molecules produced by neurons. For example, the shortage of dopamine produced by the neurons that control muscle motricity, leads to Parkinson's syndrome.

According to Pr. Yann LeCun, Turing Award (2018), electronics is a million times less effective than biology [6].

Let's now emphasize the fundamental differences between artificial intelligence and human intelligence.

Fundamental differences

This summary inventory highlights, at the current stage, what differentiates artificial intelligence and human intelligence, and what artificial intelligence would need in the prospect of competing with human intelligence.

The thought

Thought does not operate in the same elementary way as an algorithm [1]. A computer, a processor, a robot, have no conscious, no unconscious, no preconscious[5], no sensibility, no reflection, no imagination, no ability to criticize. Do calculations, sort data, drive automatically, play chess, optimize a flight plan, are not about thinking. Unlike the human intelligence, the artificial intelligence does not think. Pr. LeCun writes that nowadays, machines have neither common sense nor consciousness [6].

Instructions and education

Artificial intelligence is not free; it takes no initiative and it owns no willpower, out of a list of instructions imposed by software or given through a keyboard: the keyboard of a computer is a basic example of connection between artificial intelligence and human intelligence. The abilities of one are limited by those of the other.

The word "instruction" is a master word. Without instructions, the artificial intelligence does not operate; it needs instructions and obeys instructions, provided that the artifact is not out of order. Human intelligence does need to obey to be operational.

In March and October 2018, two Boeing 737 Max crashed because an organ on the command execution chain does not seem to have obeyed the instructions; in fact, the diagnosis is more accurate: it was a breakdown. A human intelligence would have done the job, pro-

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[5]In order to avoid a confusion, Freud has replaced the word "subconscious" which was considered a part of unconscious, by "preconscious" [4,5]. The preconscious is delivering erratic messages from the unconscious.

vided to have received the appropriate education. In this regard, instructions given to a robot are in no way education. Pr. LeCun writes that to day, a deep leaning[6] system is not capable of logical reasoning [6].

The non-respect of the implementation of the instructions by a robot or a computer does not proceed from a deliberate initiative taken by a robot or a computer, it's just a breakdown.

Data storage

The artificial intelligence has a great storage capacity, with a high level of reliability. But so far, concepts like sentiments cannot be preserved inside a machine.

Sensibility

Unlike human intelligence, artificial intelligence is insensitive; it owns no emotion.

For example, the computers are enable to store a sentiment, to express doubts, fear or joy, to feel happiness, to have empathy or compassion.

Speed of data processing

Compared to functioning of the brain, the processing speed of artificial intelligence is tremendous. Of course save time is important, but this feature does not stand out as a crucial criterion of intelligence.

Internal clock

Most of electronic systems have an internal clock, which is used as a dynamic regulator. Cells have no internal clocks, they have their own pace, called biorhythm, which is, in a way, an advantage insofar as their operation is not alienated to a rigid rhythm. Indeed, biological rhythms are irregular and imprecise, this is why one should talk about biorhythms and not chronobiology.

For example, a myocardial fragment in a glucose solute has spontaneous and extended pulsations. There is consumption of energy in the form of sugar. If we stop adding glucose, pulsations stop. Pulsations are not time; the biological rhythm is not chronobiology.

The aging

Time does not cause aging of anything. The aging of artifacts, like robots, is caused by wear, lack of maintenance and obsolescence: the wear of an artifact leads to its breakdown; the unability of an artifact to prevent gradual technological backwardness leads to its obsolescence. Two examples: the degradation of a protective sheath of a power cable causes a short circuit; the brain ages, but it keeps thinking, except in case of serious disease.

The essential criteria of intelligence

These criteria, expected from human intelligence, have not been completed yet by artificial intelligence:

- Take decision: The artificial intelligence does not take decisions on its own initiative. A NASA computer needs accurate instructions through keyboards or through any peripheral equipments.

In the movie "2001: a Space Odyssey" released by Stanley Kubrick in 1968, the computer disobeys instructions and seizes control of the spacecraft; the fiction has scared everyone, and even today, everyone still believes that it can happen.

- Innovation: The artificial intelligence is not creative or innovative.

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[6]Deep learning: Advanced learning techniques to give artifacts faculties such as detection, recognition, memorization, decision.

- Desire of learning: The artificial intelligence is deprived of curiosity; it doesn't have the desire of learning.

- Critical mind: Artificial intelligence is unable of critical analysis. It has no ability of free-will and no ethical concern,

- Progress: Progress in robots - hardware and software - is not the work of robots; robots don't generate their own progress. Artificial intelligence has no self progress. It is one of the causes of the natural obsolescence[7] of technically advanced artifacts. A healthy brain is never obsolete.

At first glance, an intelligent artifact can be compared to a screwdriver: the level of its artificial intelligence depends on the use which is done by human intelligence. A screwdriver is not smart as such, and even if it can be used as a weapon, it is not a threat.

A specialist with the smallest existing computer will make much more things than an ignorant on the keyboard of a NASA computer. Let's also remind that the first stage of organized living appeared 3.45 billion years ago: the prokaryotic bacterium is able to reproduce itself, which no system with artificial intelligence is capable of.

There is an obvious consequence: a scale defining the levels of "intelligence" will soon appear as a necessity.

Men or robots in space?

As an application, how about robots in space instead of men? The idea is sustained for three serious reasons: the danger to health with long-term flights, because of radiations and gravitational stress; the heavy logistics required by a crew, instead of electronic devices; the cost of lost space caused by human presence. Of course the robots would not decide themselves what to do during an unforeseen event. For that purpose, they would have appropriate sensors and accurate instructions, because links to the base are no longer instantaneous[8].

Conclusion

The reality is too complex to be described with a collection of numbers; so far, sentiments are not digitizable, and thought as well as culture, cannot be put into equations.

The nature and the properties of the artificial intelligence and the human intelligence are still quite different, although the difference between their operating modes seems to be gradually reduced.

Ultimately, the development of an evaluation scale is essential.

It's reasonable to think that artificial intelligence will remain subordinated to human intelligence, for the best as well as for the worst. But assert that artificial intelligence threatens human intelligence, because artificial intelligence would be in the process of taking power, stands in the realm of science fiction; but science fiction is fiction, not science.

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[7]Natural obsolescence: Caused by technical advances; planned obsolescence: organized in advance to shorten the use.
[8]A radio wave needs about 6 minutes to reach the Sun, and 4.244 years to reach Proxima Centori.

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Volume 12 Issue 1 January 2020