

## DOES ARTIFICIAL INTELLIGENCE HAVE A MIND?

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### **Abstract**

*This paper is about the mysterious world of artificial intelligence. It describes and discusses its impact on the essence of history, the renewal of societies and cultures, the evolution of politics and economics, and changes in humanity and its vision. It thus raises the problem of artificial intelligence in its many interesting — technical, historical, sociological, anthropological, economic, political, legal, philosophical, epistemological and perspective — dimensions. In this way, it focuses on the most important problematic issues related to the technological transformation of our environment.*

**Keywords:** *unsupervised learning, artificial intelligence, Turing test, Dartmouth College, robot, Epimetheus's fault, Western philosophy, perceptual learning, reinforcement learning, oxymoron.*

### **I. Introduction**

In the press release published in Nature magazine in November 7, 2019, they say: “from now on, neural network can be used to discover physical concepts without any prior knowledge, as artificial intelligence has finally independently discovered that earth orbits the sun”. This information may give rise to a smile, as the principle of heliocentrism is known from the time of the work of N. Copernicus, written by him back in 1533. To be more precise, “SciNet” neural network operating based on the experimental data - i.e. simple objective observations, realized that the sun shall be in the center of the solar system, in line with the movement of the stars and the planet Mars, as seen from the Earth. According to the authors, significance of present survey prepared for publishing in Physical Review Letters Magazine is that in the future such artificial intelligence will be able to discover new laws of physics before humans, especially in quantum mechanics, facing multiple problems today.

In fact, since any sample of artificial intelligence is a man-made instrument, such probable discoveries would have been made more accurately by a man himself, using his most sophisticated tools.

### **II. There is no artificial intelligence**

Since the earliest times, Zeus instructed Epimetheus, son of Iapetus and Clement, to distribute qualities and dignities among all living beings in a balanced proportion (claws and hooves for hunting to ones, and hooves, scales or wings for defense to others). Epimetheus fulfilled the task. Each animal was given the power to perform own role on the great stage of life. Nature could flourish, blossom, and acquire immortality. But Epimetheus forgot the man (in ancient Greek "Επιμηθεύς" - Latin "Epimetheus", which might mean “*hindsight*”, literally “fore-thinker”). All possibilities and attributes were exhausted, nothing was left for man. Prometheus, the brother of Epimetheus, under the influence of the impression of seeing such a naked and completely disarmed man, stole all art creative fire from Hephaestus and Athena and handed it over to humans - the most sinful creatures among animals. This petty theft was followed by severe punishment from the gods,

as balanced world conceived by Epimetheus immediately became one kind of tyranny. Now only he would master the technics, begin to rule the world and win all other animals.

The myth of Epimetheus retold in one of Plato's dialogues - "Protagoras" - is rich in lessons. The deceased French philosopher considered one of the most influential philosophers of the 21st century in Europe, Bernard Stiegler (1952-2020) sees in this a reminder of the calamity, distress, or, as biologists say, the prematurity, ephemerality in which man exists, but divine donation of technology, allows him to correct his gifted original defects and tenderness [1]. Thanks to the destiny, intervention of Prometheus, the innate weakness of Adam's descendants became an excessive advantage, an excessive force, a destructive force for other living beings and, possibly, for himself.

Human instruments expand opportunities of their bodies and reflects their thoughts. As taught by the anthropologist Andre Leroy-Gurhan [2], each instrument externalizes a certain function, taking it out. At first these were about the simplest and most difficult ways to use materials (say, with the help of a stick or a hammer). Further the contribution of technologies was becoming increasingly sophisticated, skilled, and revolutionary (using energy machines that increased or replaced muscle brute force in a much more efficient way: with a cart, wheel, steam engine, railroad, automobile etc.). Later, sensor devices appeared, which were the tools to refine and expand the capabilities of the sense and perception organs (telescope, microscope, optical telegraph, photography, cinema, etc.). Finally, information systems emerged, the latest and most advanced generation of technologies. In this case, the goal is already to increase and even change the intellectual functions and capabilities of mankind with the help of books, calculators, computers, hard disks, electronic and computer networks and other factors.

But the art of alphabetic decomposition, logic, rhetoric or memorizing (storing information) already is an important intangible technical achievement still in use today, facilitating support and perfection of affords of decades in the field of data or knowledge analysis and synthesis. And this forms in-depth intellectual features of "thinking and classification", as said by Georges Perec (1936-1982) - famous French writer and wonderful verbicrucist (author of crosswords)[3].

Technological organs and mechanical or electronic prothesis closely accompanied hominization (the process of evolutionary development of primates into human) and, in the first place, humanization (the process of turning prehistorical human into the historical human, premodern in thinking - into modern thinking, savages - into civilized people, dark - into educated, people - into citizens, barbaric hordes - into peaceful societies, anarchist groups - into state organizations). However, it can happen that the evolving union of people and their machines reach their culmination, stop the process of civilization, begin to regress, stimulate the processes of dehumanization and dehumanization, because technological equipment becomes very invasive (with "contagious" damage from device to device), scaring, depressing, and containing the signs of "aging", "obsolesce". Can this day belong to the past?

In any case, biological evolution is closely related to the technical evolution. Biosphere is strongly and increasingly widely related to the techno-sphere. The impact of a human on the technology is practically complete; however, the impact of technology on a human is also very important. Relationship between human and instrument, creature and vehicle, living creature and robot, natural and artificial plays main role in the greatest movie of the mankind, history, societies and cultures. Ones create and use others, who, in their turn, make reverse impact on them, forming their thoughts and conduct. Separation of a human and society from their technical and technological environment becomes more and more difficult. From the petroglyph of the rock (cave) cut out with flint-stone by prehistoric man to the invention of writing, from Johannes Gutenberg (1397/1400 - 1468) to the mass digitization of data (digitization) - is long history of technics and technologies, similar to the history itself, standing at its origin and making grounds to the evolution of the mankind. The instruments invented by a human transforms him, personal and professional activity, means of communication, methods of consumption, types of transport or the methods of observing or event thinking about the world. And the more time passes, the more

problematic the closeness between a man and technology becomes, until we no longer even know who we are dealing with -with one or the other, and in such case Turing Test is successfully passed.

This is especially actual in relationship with the artificial intellect, algorithms, robots, when achieved level of relevance of their response reminds us of natural mind.

The history of development of technologies is characterized by consistent crossing of different limits - so-called Ratchet Wheel.

To make the reason for metaphorical use of this term clear, it will be enough to refer to Feynman's lectures in physics [4]. He describes a simple device that logically allows only one direction of rotation of an axis.

Let us assume that there is gas in the utensil at particular  $T$  temperature, and there is screw rotator inside (Fig. 1). Herewith, we assume that  $T_1=T_2=T$ . Due to the collision of the gas with the molecules in thermal motion the rotator will begin to swing. Now it is enough to attach the wheel to the other end of the axle, which will be able to rotate in only one direction - *the wheel with lock (with trigger, ratch)*. The trigger prevents attempt of the rotator to rotate in one direction, but it does not prevent its rotation in second direction, and it will rotate to the same direction. Second slotted wheel called pulley, fixed on the axis between the wheel and the rotator and there is thread twisted in the slot, also slowly begins rotation to proper direction. If we are able to attach a flea, it may be lifted up and work be done!

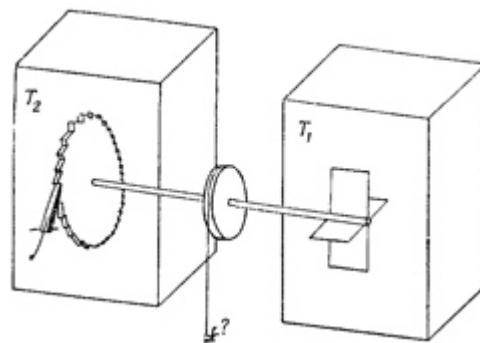


Fig. 1. Device containing a wheel and a trigger (ratch)

Obviously, our idealized wheel is very simple, but as for the lock (trigger, ratch), it needs an additional spring. The fact is that after passage of one tooth, the trigger must return to the previous position on the next tooth, which cannot be done without a spring.

Is this possible? Of course, we are not going to discuss this issue, as we needed substantiation of using the only phrase “*Ratchet Wheel*” as metaphor.

The invention of the printing press by Gutenberg meant the disappearance and extinction of the medieval monk-rewriter; creation of the optical telegraph and the railways, left horses and chariots behind; adventing of computers and electronic calculators played funeral requiems for abacuses and operations scratched on papers; digital files and live streaming, delivering multimedia (video and audio) information to the user in real-time have led to a sharp decline in the use of CD players and Hi-Fi (High Fidelity) systems. However, due to their emergence, gramophones disappeared, and vinyl records were “marginalized” - expelled, almost completely removed from widespread use. There is no doubt that artificial intelligence is a new and very powerful irreversible trigger.

Moreover, the revolution in the field of artificial intelligence might only begin now. Nobody can say what the results will be after 20, 50 or 100 years. This is why the issue of artificial intelligence has led to such a passion: it remains largely unexplored, unlearned and uncertain.

At the same time, it is this circumstance that gives birth to the fantasies and fears. Futurologists, as well as specialists of new technologies argue that artificial intelligence will

replace, and often radically, many practical approaches. But they have significantly different opinion regarding direction of development of this changed form of practice. In the first place, this probably touches upon the researchers: objects of their studies suffer evolution of material degree, while means for studying these objects are going to be significantly upgraded. Artificial intelligence in all aspects is actual and prospective theme to the scientists of multiple directions.

Interestingly, the book considered to be treasure, representing French dictionary of the nineteenth and twentieth centuries published in sixteen volumes and being freely available on the Internet since 2002, [5] defines intelligence as follows: “*mental function of organization of reality in thoughts with man, and in actions with man and animal*”. According to the same dictionary, “*intelligence is the totality of mental and psycho-neurological functions, promoting cognition, and understanding the essence of nature and facts of subjects*”. Thus, the artificial intelligence itself either has no intelligence at all or its intelligence, mind is too weak. We will get back to this issue.

However, intelligence, according to the referred source, also is “mindfulness of something, its understanding with ease of in-depth knowledge”. In this sense of the artificial intelligence, mind, the intellect is still in the embryonic state and is not even complete, which pushes us to contribute to its deepening and refinement. Therefore, our conversation is aimed at making even a small contribution to its study and comprehensive understanding. All experts today agree that artificial intelligence was being evolved pragmatically since recipes that work have been found, although there are not enough concepts and theories to support and explain its idea. In this respect, the situation is the opposite of the state of informatics, which is able to implement number of rather old concepts in a completely new way even now. So the existence of intelligence, mind in artificial intelligence is actually necessary. No definition of artificial intelligence has been developed to date, based on criteria for identifying and operating this phenomenon.

Artificial intelligence seems to be phantom to a human, because it is extremely difficult to understand the meaning of *a priori* - oxymoronic expression. The word of Greek origin ὀξύμωρον (as ὀξύς «sword» and μωρός «stupid» merged components) is pictorial combination of contradictory concepts; a witty combination of contradictory concepts, paradox, stylistic approach or stylistic error, a combination of words of opposite meaning (i.e., a combination of incompatible words). For example: “living dead”, “dead souls”, “end of infinity”, “optimistic tragedy”, “blind watchman”, “true lie”, “Small Grand Hotel”, “widely closed eyes”.

But artificial intelligence affects each person in their daily activities and personal life. It also has a magical side, as it gives impressive results while its operation and mechanisms remain completely incomprehensible to most people. Therefore, due to the general nature of the conversation, we do not intentionally avoid defining and explaining some of the basics.

Informatics belong to the field of rational processing of information, in particular, via automated machines. Artificial intelligence is the technology, which may take the outcomes similar to the human mind. This is computer instrument, and it performs actions or tasks, which were the prerogative of living creatures - human or animal.

American scientist in the field of artificial intelligence, of Turing Prize Laureate Marvin Lee Minsky (1927-2016) is among the scholars introducing the term “*artificial intelligence*”. Minsky determines this concept as follows: “the science of making machines do things that would require intelligence if done by men. It requires high-level mental processes such as: perceptual learning, memory, and critical thinking (reasoning, inference)”. Simply saying perceptual (Lat. perceptio - *perception*) learning is a change in response to sensory stimuli, perceptions acquired as a result of repeated exposure to these stimuli, without special reinforcement.

Informatics, as computer instrument is based on the mathematical formulas and statistical processing sequences. It works with “input values” (initial data) and achieves “output values” (outcomes) by performing different pitches and stages, requiring calculations, logical operation, comparisons or analogs. Thus, artificial intelligence belongs to technological devices designed to imitate and ultimately replace natural intelligence. It seeks to reflect the ability of a man and an animal to perceive, distinguish, understand, learn, discuss, calculate, remember, compare, choose

etc. But artificial intelligence does not even try to imitate the functioning of biological intelligence, but only the results that the latter achieves - the connection between them is about the same as between a plane and flying birds or a car and running. Objective of researchers of this domain is not and has never been creation of technological mind, which gets as close as possible to the natural brain, human mind and thinking; we speak only about creation of computer instruments, which may have more relevant - in line with the consumer's demands - outcomes, mostly through statistical analysis of data.

The word "intellect" is derived from the Latin words "*ntelligentem*" or "*intelligere*", which mean to understand, to discern something, to see the difference. "*Legere*" means "selection", while the prefix "*inter*" is translated as "between". Intellectual is one who has the ability to choose between different alternatives and to compare objects to get to know them better. Humans and animals, of course, have this ability. Hence, "intellectual" aspect of artificial intelligence is in line with the objective and skill of imitation of human or animal conduct, while "artificial" aspect belongs to the application of computers and other electronic and technological processes. Therefore, artificial intelligence borrows ideas about informatics, logic, mathematics, electronics, cognitive theories and communication from the scientists and even neurobiology and etiology - from science, which studies biological grounds of animals, mostly conduct under biological conditions. It carries out their compliance to the deep learning methods, which are developed based on the interrelated neural networks.

However, although artificial intelligence can rearrange its knowledge system or data perception according to newly acquired information. No computer, algorithm or neural network thinks and has intelligence in the strictest sense of the word - its teaching and decision-making skills are programmed or at least, is automated, which only creates the illusion of intelligence, or - a very weak intellect, since it is practically mechanical. Artificial intelligence is practically incapable of solving its own tasks autonomously or of creating new ideas about the world by which it can be guided in its reasoning. However, there actually is no reasoning since it is only a reflex and automatism. That is why the term "artificial intelligence" is too exaggerated.

In fact, it is not about intelligence, but only calculations (let's face it, learned calculations), statistics and computer operations.

Hence, speaking about "artificial intelligence" linguistically is an unjustified use of this construction. "Artificial intelligence" is made of English words. In the language of William Shakespeare (1564-1661) these expressions touch upon simple data management, information processing and artificial type of intellect understood in non-Georgian, say, French language. In the referred languages, the term "artificial intellect" may be better translated as "artificial comprehensiveness", which means *common sense, empathy* (ability of a human to sympathize others and understand their psychological state), *substantiated will, and the ability of understanding and cognition of own intelligence*. Briefly saying, using the term of "artificial intelligence" in English language to denote these new technologies is justified and it will not be misleading people. However, in Georgian language, as, by the way, in French, it is quite awkward to speak about artificial intelligence.

Currently, robot has no ability to use reasoning, it has no belief, it almost does not take own decisions, it has no intention or attention, it cannot set new goals and objectives, does not build reality in mind, cannot develop a concept or put an idea forward, has no culture and moreover general one, it has no self-consciousness and the survival instinct - all main signs of intelligence. A human is characterized by wisdom, freedom and the ability to open up to a stranger. Robot is absolutely different from a man. And still "artificial intelligence" is almost the same, as speaking about "artificial mankind". Artificial intelligence is *anthropomorphism* (transferring human abilities to the natural phenomenon, plants and animals). We humanize and vitalize what is still just an animated object, a machine and a supercomputer. Turing Prize Laureate French researcher Yann André Le Cun (1960) nevertheless believes that artificial intelligence will soon be able to express

feelings and emotions. At the same time, he indicates that this will take place only because artificial intelligence will be able to quantitatively measure joy, fear or melancholy. But can such calculated joy, fear, or melancholy, which are not felt or experienced, be considered real emotions? Could not it be better to talk about “automated learning”, “statistical” or “prognostic” tools, “autonomous” or “adaptable” agents? Today artificial intelligence performs computer tomography better than X-ray, diagnoses cancer better than an oncologist, drives a car better than a driver, but he does not know what X-ray radiation is, what a malignant tumor is, what a car is or what it means to drive.

Since the term “artificial intelligence” (or AI for short) is widely used in both - public debates, and specialized discussions and even in the name of a new field of scientific research, it is difficult to describe the present discourse in any different way, as the subject of conversation remains unclear. Moreover, as this comprehensive term means different and diversified technologies, it would be more logical to speak about “artificial intelligence” using plural. However, the experience of use gives preference only to numbers when it comes to the general concept of “artificial intelligence”.

The fashion for “artificial intelligence” and its English abbreviation “AI” appeared not so long ago, as evidenced by the statistics of queries entered in the most famous search engine - the Internet (Fig. 2). This fashion is so strong that, when speaking about artificial intelligence, we may always use its abbreviation and speak only about “IA”.

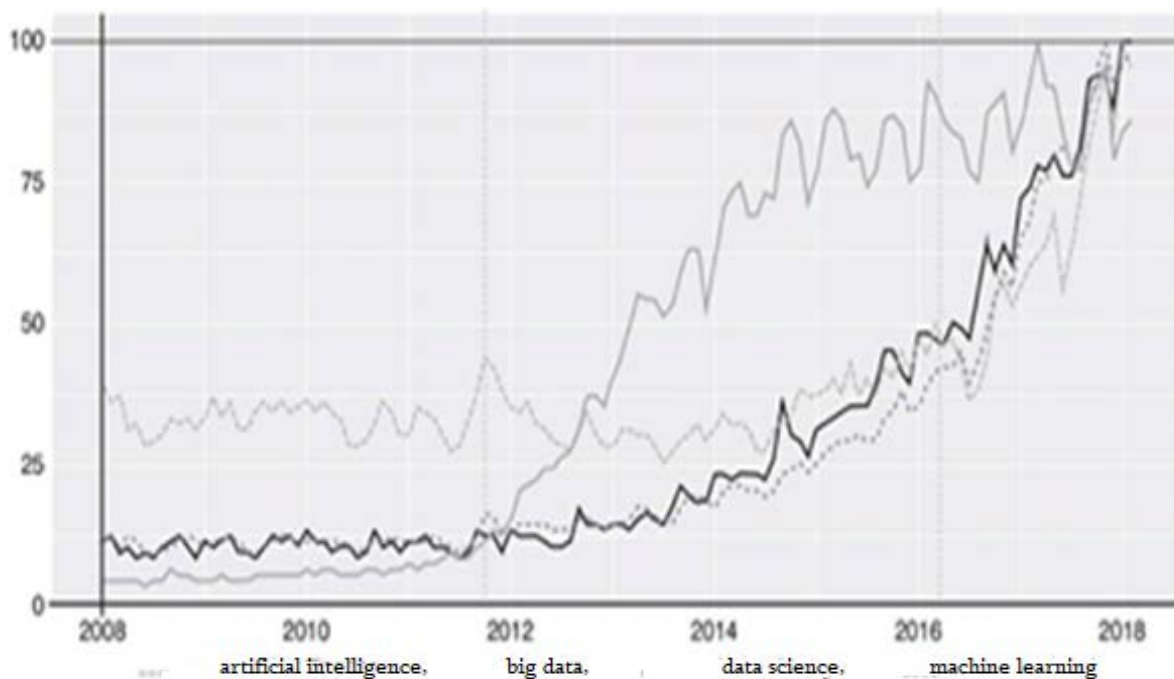


Fig. 2 Online search per the topics related to the artificial intelligence.

Fig. 2 given on the basis of the work of Lino Galiana [6]. The source here is data of Google Trends. They are normalized. For each query, normalization is made as a percentage of the maximum number of queries observed over a period of time. Google Trends - is website of the Google Company, analyzing popularity of the best search queries in Google search, in different regions and different languages.

In 1956, four of American mathematicians - John McCarthy, (1927-2011), Marvin Lee Minsky (1927-2016), Claude Elwood Shannon (1916-2001) and Nathaniel Rochester (1919-2001) organized seminar dedicated to “thinking mechanisms” for the scientist from around the world in the private research university - Dartmouth College in the city of Hanover (New Hampshire).

The term “artificial intelligence” was first introduced on the Seminar. British mathematician Alan Mathison Turing (1912-1954) is also considered to be the author of the idea, and even the term of artificial intelligence. He was concerned in the problem back in 1950, when working on the “imitation game” (i.e. “Turing’s Test”): this test involves placing a person in a covered verbal

confrontation with a computer and another human (Fig. 3); if the first person cannot say which computer is among his interlocutors, then the computer has passed the test [7].

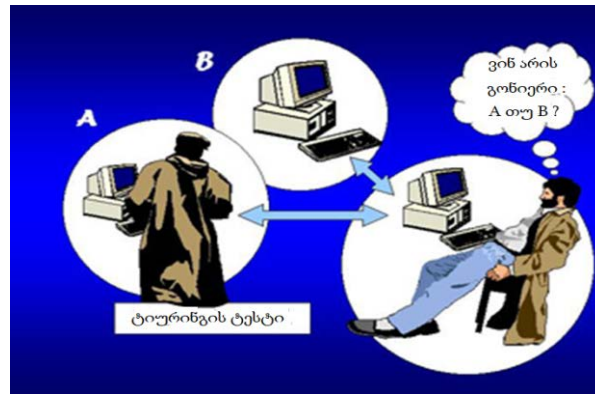


Fig. 3 Turing test (1950)

New field of scientific education and survey appeared, aiming at creation of learning-able mechanism, which have been considered so and left to the fictional unreality to this day. In particular, this machine shall learn, especially, on own errors, understand the environment and the world in general, match the changes, foresee and forecast the future, and act to improve living conditions of a human. The more comprehensively this initial goal is achieved, the less frustrated a person will be with artificial “*intelligence*”. Then it will be possible to rightly compare it to the biological intellect.

However, for now what is called “artificial intelligence” remains the product of a human intellect, its creations and reflections, though on the whole it lags far behind it. In order to turn it into reality, artificial intelligence shall gain autonomy and freedom of will, separate from parenting persons. It will have to become a common artificial intelligence, having the ability to understand, to learn the functioning of the universe in all its depth and fullness through simple observation, as children do in the first years of their life. However, this will not be easy to achieve, although machine learning has even begun to be applied to it to force computers to build neural networks. So artificial intelligence will someday be able to create another artificial intelligence. It is hard to imagine that artificial intelligence would join the natural intellect and overtake it. Such a thing can probably only happen in very specific tasks, which are likely to be based on statistical processing of data. However, many resolution processes can be conducted in a variety of ways and do not involve the mandatory use of statistical approaches or the persistence of prevailing statistical trends.

When the researchers from Dartmouth College invented the term “Artificial Intelligence”, this was basically the marketing move, almost purposeful lie: they used a sensational lie to then get research funding from US government. This is intentional distortion of reality reminding distortion of reality by Eiríks the Red. “Saga of Erik the Red” (Eiríks saga rauða) in Icelandic: Eiríks Saga Rauða, tells us that Eirík took his people to Greenland and made them believe that it was a “green country” (because that is how the word “greenland” translates - “groenland”), when in fact it was a white country covered with snow and ice. However the name “Greenland” remained, and people got used to it. The Icelandic saga to the Viking voyages is dedicated to the discovery of America long before Columbus. Ontologically, the concept of intelligence (i.e. in terms of existence, essence, structure) has biological grounds and “artificial” intelligence, even by determination, cannot be intelligent. However, this does not prevent artificial intelligence to do great job and simultaneously create multiple challenges to the human intelligence, and in the first place to his intellect, i.e. his understanding, perception, explanation and critical analysis of the world.

### III. Conclusion

• Better understanding of artificial intelligence, understanding its “intellect”, as denoted by Boris Barraud in his work [8], whose ideas is widely reflected in present article, foresees unification of four cognitive affords of meta and mega revolutions (source of other multiple and diverse revolution). In particular following shall take place:

- Consideration of artificial intelligence as the tool created by and only for a human, which will show us the prospects of the mankind;
- Paying attention to the improvement of technology of artificial intelligence and expansion of the field of application, showing technical prospects;
- Focusing at the social, political and economic outcomes of artificial intelligence, by which we share a civilizational perspective.

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