Artificial Intelligence: illusions and reality

Abstract

On a theoretical level, the author shows that there is nothing truly intellectual about artificial intelligence (AI) and, in principle, there cannot be. Considering the vast practical experience of using AI technologies in medicine, he draws attention to the fact that AI does not manifest itself as an intellectual subject. It only processes huge amounts of data using rigid algorithms and has nothing to do with the semantics of the results obtained. The results of AI calculations are given meaning by people - specialist doctors. It is concluded that AI technologies have great prospects both in medicine and in other areas of social practice, but they will never replace humans in solving problems that require original approaches and creative inspiration.

Keywords: artificial intelligence, AI technologies, AI in medicine

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Introduction

After John McCarthy recklessly proposed calling computer systems that exhibit signs of intelligent human behavior (learning, language comprehension, problem solving, reasoning, etc.) the metaphorical (as it seemed to him) term "artificial intelligence" (AI) at a conference at Dartmouth University in the summer of 1956. a mandatory attribute in the subject of scientific publications, it filled the media space, inspired science fiction writers, and became the subject of heated discussions among ordinary people. The emergence and early successes of AI have generated, especially among the lay public, a lot of enthusiasm, hopes, fears and illusions. Admiring the promised prospects and capabilities of AI, even then, at the turn of the 50s and 60s of the twentieth century, people really feared that in the near future "artificial intellectuals" would crowd out and eventually be able to replace them with all the ensuing consequences. And for the eighth decade now, we have been predicted that very soon accountants, machine workers, drivers, and engineers will go under the knife, AI will do routine operations and calculations in a split second, develop innovative and original technical solutions, and innovations will not be shoveled.

An apocalyptic mythology has gradually formed around AI. Can machines put people out of work, get out of control, and destroy their creators and all life on the planet? Many films have been made based on these scenarios. What are the meanings, goals, and priorities of AI development? What is worth doing, and what is dangerous to do, etc.?

A new surge of interest in the issue of "artificial intelligence" occurred in 2016, when these words were uttered from the rostrum of the World Economic Forum in Davos by its permanent chairman Klaus Schwab, an ardent admirer of AI ideas. Since then, the issue of AI has taken a firm place on the agendas of the most important mass media, the program speeches of the presidents of economically developed countries, and relevant structures with multibillion-dollar financing have emerged in their governments.

What can explain such an extraordinary interest in the field of AI?

AI is based on the belief in the fundamental possibility of computer simulation of human information processing mechanisms. The traditional, one might say epic, beginning of the discussion about AI by its developers is based on the idea-the postulate that the human brain is similar to a computer, that human thinking and the processes of information processing by a computer are fundamentally the same thing. The following is a list of the technical characteristics of modern computers, which turn out to be many orders of magnitude higher than similar characteristics of the brain. It is this circumstance that is an irrefutable (for them) argument proving the fundamental feasibility of artificial intelligence. They are sincerely convinced that the main task of AI development is to correctly model the neural networks of the brain.

As a result, the idea that humans, like computers, are information processors has become firmly entrenched in people's minds. The development of this field involves thousands of studies, consumes billions of dollars of funding, and has generated a huge body of literature of various contents: from strictly scientific monographs and articles to fiction, mainly fantasy fiction. Huge amounts of money are allocated to research on brain activity, based on often erroneous ideas and impossible expectations.

However, despite the fact that almost eighty years have passed since the idea of AI appeared, no artificial intellectuals have appeared. None of the many predictions of the famous futurist Raymond Kurzweil[1] Klaus Schwab[2] and others have been realized.

This situation forces us to take a closer look at the conclusions of scientists who do not share the enthusiasm of AI fans. Already in the 70s and 80s, many scientific papers appeared in which the claims of "artificial intelligence" to replace and/or surpass natural intelligence were highly criticized.[3-8]

The initial postulate of these authors was that the computer functions strictly according to the laws of the physical world and represents the implementation of those algorithms that are embedded in it by the programmer (software). Therefore, it can reproduce anything, but only what can be exhaustively presented in any formal language and in a format that meets the requirements of its element base. Since the human mind can generate abstractions that have nothing to do with the laws of the real physical world, that is, to create the most fantastic abstract constructions that are inaccessible to exhaustive representation by formal means, no "mental" processes in a computer cannot be reproduced by definition.

A person shows his intelligence and personality through natural language. Therefore, when there is a desire to create a model of the human mind, it is necessary to answer the question whether the conceptual basis underlying the linguistic manifestation of thought processes and their linguistic understanding is (at least in principle)

exhaustively formalized. In addition, a person as a subject of the social world is largely determined by the tasks he faces in this world. In turn, the content of these tasks is determined by its unique intellectual, biological, emotional and other characteristics. Thus, the second question arises: "Is another living organism, or even more so, a computing machine (computer), capable of perceiving exclusively human problems in human terms?" Obviously, the answer to both questions is categorically negative.

One of the most famous critics of AI is the philosopher J. R. R. Tolkien. Searle, who works in the field of philosophy of language and philosophy of consciousness and calls himself a "practicing cognitive scientist".[9]

Searle distinguishes between the "strong" and "weak" versions of AI. The "strong" version reads something like this: "Consciousness relative to the brain is like a program relative to a computer." In this case, it is explicitly stated that thinking and reason are equal to computational processes. In the "weak" version, it is believed that modeling the process of computing data on a computer is important for building hypotheses about the flow of thought and other mental phenomena in humans.

In contrast to the "strong" version, Searle presents his own understanding of the nature of consciousness. He argues that mental processes are not limited to formal, "syntactic" information processing, but also involve semantic aspects. For example, human understanding of language is based on the interpretation of potentially ambiguous symbols, which is not possible for computers. The semantic aspects of mentality are determined by the inherent intentionality and subjectivity of consciousness, as well as the presence of "background abilities" and "background knowledge," which refers to knowledge of the real world. A computer does not possess intentionality, and therefore it cannot possess understanding.

An example of computer analysis of natural language processes is illustrative. To model language comprehension by a machine is to somehow replicate the conditions and methods of human comprehension, which necessarily involves knowledge about the world, understanding of the contexts of speech, and knowledge of linguistic actions. In human speech, what is not said is as important for effective communication as what is said; all kinds of inferences are present in the process of understanding; in addition, the aspect of understanding such as "beliefs" and "background knowledge" is important. How can all this be taken into account in "understanding" computer programs? It is no coincidence that existing AI systems that use natural language cannot produce a statement in the same way that a human does: these systems can only communicate with a human in a very limited sense.

It is clear that the development of programs that understand natural language requires answers to questions about the functional properties of language, the development of a theory of memory, the consideration of knowledge structures, the study of the pragmatics of communication, and the philosophical exploration of the nature of consciousness. In any case, whether the researchers are working on a "strong" or "weak" version of AI, these developments deepen our understanding of human beings, their consciousness, and their mental abilities.

In his article on artificial intelligence, thinking, and self-understanding, renowned AI representative R. Schenck said: "Artificial intelligence is part of the general desire to understand thinking. We believe that he makes an important contribution to these efforts and that they are the goal of our science. The programs we write are an experiment, not a result. Our interest is intelligence, not an artifact. As we progress, the results will pave the way for automatic partners who may become a necessary part of daily life. However, this will not be our real result. The real result will be a new understanding of ourselves, an understanding that is ultimately much more valuable than any program".[10]

Thus, the development of artificial intelligence provides new opportunities for understanding the person himself, his cognition and consciousness; it allows us to find new approaches in anthropological research. For example, when during clinical death a person finds himself outside his body, sees it from above and hears the conversations of people around him, he continues to be conscious and continues to think. By what? The brain and neural networks and connections remained in the body.

Unfortunately, we have to admit that humans cannot be reduced to any kind of machine that no artificial intelligence exists and cannot exist in principle. Computer intelligence can be nothing more than a perfect calculator that expands the possibilities of natural intelligence in various fields of its application. There are huge databases and there are many ways to select, correlate and combine these data according to hard-coded algorithms, which are combined by the concept of "AI technologies". All the gaming "wonders" that delight ordinary people, representatives of the so-called "creative" professions and (sometimes!) people with an education, sometimes with a specialized one, and who are always used as an indestructible proof of the "reasonableness" of AI, are obtained in this way. No matter how complex and sophisticated the algorithms and/or their combinations that form the basis of computer technology software may be, they "work" only in the space of a finite set of domain scenarios provided by the programmer. This set of scenarios can be huge, but inevitably finite and in its content does not go beyond the a priori concepts known to the programmer about its possible states. For this reason, no AI can ever become a source of fundamentally new knowledge. It is not surprising that despite more than seventy years of "development" of artificial intelligence, nothing artificial has yet been created that we can rightfully call intelligence, and there are no valuable scientific discoveries behind it.

Binary encoding (digitalization!), the source data, the rigid storage system and the algorithmization of their transformation do not even remotely resemble the process of human mental activity and have nothing to do with intelligence.

It's time to finally admit that a computer with "artificial intelligence" is a technical (maybe very complex, unique, but technical!) a system designed to automate routine work. People are responsible for the operation of any technical system. "Artificial intelligence" is no exception: people make up the training sample, people also come up with a model for forecasting or decision-making, an algorithm that determines the parameters of the model based on the sample is also created by people, and finally, computers on which it all works are also made by people. There are many links in this chain, and there are people everywhere. If the professionals have not provided for something, they should fix it, draw conclusions for the future, and in some cases take responsibility. Calling such systems "artificial intelligence" is, in my opinion, a terminological misunderstanding.

However, there is still a certain euphoria in the media about AI. Business representatives, many politicians, and journalists say that AI means a true revolution in all areas of public life, that AI will prolong human life and make it more perfect, increase economic productivity, ensure the security of the state and the individual, and so on. In short, AI is presented as a gateway to a brighter future in the public consciousness.

AI business leaders are not stingy with their huge investments in AI projects. Investments are made in the construction of data centers, the purchase of GPUs (graphics processing units), the creation of various infrastructure, etc. According to Gartner, Inc., global spending on artificial intelligence in 2022 was less than \$70 billion; in 2025, it is estimated to reach almost \$1.5 trillion. Next year, it is projected to reach \$2 trillion, or 32 times more than in 2022. Such gigantic investments have previously been made in nuclear energy or space exploration. However, financial analysts are increasingly skeptical that the current gigantic physical assets in AI will ever generate returns comparable to those of nuclear and space projects.

This is because, after a prolonged period of AI-driven euphoria, there are signs of a stock market "bubble" in early autumn 2025. There is more and more data in the media showing that investments and expectations around AI are growing faster than the actual capabilities of the technologies being developed. Investments by IT companies in AI are growing. The market capitalization of these companies is growing even faster. As a result, the inflow of investor capital into IT companies is also growing. However, IT companies either have no profits at all or have very little profit.

According to experts, the market price of American IT companies in the third quarter of 2025 exceeded their profits by 41 times. This is a P/E indicator — price/profit. Economics textbooks usually say that a P/E value of less than one is a sign that a company is in trouble. A company with a score from 1 to 2 should be considered safe and stable. With a higher value, there may already be a risk of a "bubble" forming. More precisely, the risk of this "bubble" collapsing. And around September, there was growing concern in America about the AI companies' "bubble" and its potential collapse. If this happened (and this is inevitable!), all the massive investments in AI would become worthless trash.

As we can see, both the real economy and theoretical research clearly indicate that there is no reason to expect even the most basic artificial intelligence in the foreseeable future.

Thus, the most constructive prospect of using AI in social practice is to become an obedient, reliable and effective assistant, leaving people primarily with creative work and key decision–making, that is, in the form of AI technologies. Let's look at the example of medicine, where AI developments have already found wide application.

The prerequisites for the rather intensive use of AI technologies in medicine are due to several trends at once: the availability of powerful graphics processors and the growing computing power of modern computers, the development of cloud computing, and the explosive growth of large amounts of data. These technologies have made it possible to perform automated machine learning with high accuracy of the resulting models, which in turn has opened up numerous examples of successful automation of processes and prospects for digital transformation of healthcare with the ability to reduce costs and increase efficiency.

Three AI areas are developing most successfully in Russian healthcare: medical image analysis (for example, X-rays and CT scans), medical decision support systems, and automation of routine work (filling out medical records, making doctor's appointments, etc.). By the end of 2024, about 1,8 thousand medical organizations in 72 regions Russia has introduced computer vision-based medical image analysis systems. At the same time, the average accuracy of AI diagnostics reached 87%, and the speed of diagnostic processes increased by 50%.

By the middle of 2025, there were already 67 different AI systems for medicine and healthcare on the Russian market. All of them are grouped into several groups:

i   Radiological image analysis.

ii   Analysis and maintenance of electronic medical records.

iii   AI services for patients and personal health management.

iv   AI solutions for laboratory diagnostics.

v   AI solutions for dentistry.

vi   AI solutions for ophthalmology.

vii   AI solutions for endoscopy.

viii   Other AI diagnostic solutions.

ix   Remote monitoring and treatment.

x   Other AI solutions.

By now, the content of the main directions of application of AI technologies in Russian medicine in the shortest possible way is as follows.

Medical imaging: analysis of X-rays, MRI, and CT scans with 94% accuracy. Computer vision algorithms help to find anomalies in images, save time on interpreting the results and provide doctors with additional information about the pathology.

Early diagnosis of cancer: detection of tumors in images with superiority over radiologists. AI technologies are able to detect subtle changes in tissues that can be missed by the human eye, which is crucial for early detection of diseases.

Genetic diagnostics: analysis of genetic data to identify hereditary diseases. Modern genetic tests can identify from 30 to 3000 mutations, revealing a predisposition to cardiovascular, oncological, endocrine and neurological pathologies.

AI technologies are changing the approach to creating new drugs, making it possible to shorten the research time and bring safer and more effective drugs to the market.

Machine learning algorithms analyze huge databases of chemical compounds and biological data, which speeds up the stages of candidate search and optimization of molecules by several times compared to traditional methods of drug development.

In personalized medicine, AI technologies are used to analyze a patient's genetic and clinical data, helping doctors select therapies and dosages based on individual characteristics.

Thanks to side effect prediction models and pharmacogenomics, the risk of ineffective or toxic treatment is reduced to a minimum, which increases the safety and quality of medical care.

i   Acceleration of development: reduction of average opening times and preclinical trials by 30-50%.

ii   Personalized treatment: analysis of genetic data for the selection of individual therapy.

iii   Selection of drugs and dosages based on age, gender, concomitant diseases and genetic markers.

iv   Predicting side effects: minimizing the risks of drug therapy and improving patient safety.

Digital medical assistants and chatbots are also used. They are becoming a key element of AI in healthcare, acting as an accessible "first screen" for the patient. In addition, they provide round-the-clock support: they analyze symptoms using questionnaires and algorithms, help you make an appointment with a doctor, remind you about taking medications, and monitor your well-being. Chatbots are actively used for the prevention and maintenance of chronic diseases, psychological support and rehabilitation, which improves the quality of telemedicine and expands access to medical care even in remote regions.

There are many more possible directions and forms of highly successful use of AI technologies in medicine, but the above is quite enough to draw certain conclusions.

AI technologies in the healthcare sector cover a wide range of applications, from automating routine processes to identifying hidden patterns in medical data.

Artificial intelligence has achieved particularly impressive results in areas where diagnosis is based on visual analysis, which is why dermatology and radiology have become the first specialties where AI has achieved accuracy comparable to specialist doctors.

Modern neural networks are capable of processing huge amounts of medical information in a matter of seconds, identifying pathologies that may escape the attention of even experienced specialists.

But it is also obvious that in none of the considered areas does AI manifest itself as an intellectual subject. He only grinds gigantic amounts of data in a certain way at breakneck speed, choosing among them the desired objects in strict accordance with the established requisites and combining them according to specified algorithms. AI technologies have nothing to do with the semantics of the results obtained. The results of AI calculations are interpreted and given meaning by people - specialist doctors, owners of natural intelligence.

Thus, we can conclude that AI technologies have great prospects both in medicine and in other areas of social practice, but there is not the slightest reason to expect any new discoveries and intellectual breakthroughs from them either today or ever in the future. They do an excellent job with routine tasks (medical diagnostics, statistics, programming, law, etc.), but they will never replace a person when solving tasks that require original approaches and creative inspiration.

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Conflicts of interest

The author declares that there is no conflicts of interest.

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