

Introduction to Artificial Neural Networks

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ABSTRACT

Today, many different methods are used in the field of artificial intelligence (AI) research. Leading among them are the methods of mathematical, cognitive and philosophical sciences. All research approaches are united by the hypothesis of the fundamental comparability of natural and artificial intelligence. The purpose of writing the article is to clarify the theory of the creation of artificial intelligence and modeling approaches, as well as the main developing areas.

INTRODUCTION

I am sitting at home drinking tea with lemon and watching the actions of a 6 year old daughter, she communicates with a virtual voice assistant ALICE on an ultrabook, she answers any questions of a 6 year old child, watching this I became interested in how it works?

Alice is a virtual voice assistant created by Yandex. Recognizes natural speech, simulates a live dialogue, provides answers to user questions and, thanks to programmed skills, solves applied problems.

New - AI technologies and neural networks development of the browser "Yandex".

In 2022, Yandex developed a new project based on neural networks and AI on its web browser. Translation of video files online. For Russian speakers, translation is available, while 4 languages are English, German, French and Spanish. By the end of the year it will increase by 38 translation languages.

It turns out that according to Yandex, the daily audience of the voice assistant " **Alice** " is 12 million users.

And after that, I began to be interested in the basics of such smart burnouts.

How does Yandex teach artificial intelligence to talk to people?

Yandex Company Blog Search Technologies Data Mining Machine learning Voice interfaces.

Alice voice assistant works on the basis of machine learning, thanks to technologies such as machine learning, the actions of machines are approaching human ones, it is reflected in the areas of robot technology in medicine and can be seen in China, including in many countries public places in hypermarkets have begun to use artificial intelligence to maintain public order of various kinds.

The human brain is real evidence that massive neural networks exist that can successfully solve those cognitive, perceptual and control tasks that people excel at speed. The brain is able to perform computational perceptual activities (eg, face recognition, speech) and control actions (eg, body movements and bodily functions). The advantage of the brain is its efficient use of massive parallelism, highly parallel computing structure, and imprecise information processing capabilities.

The human brain is made up of over 10 billion interconnected neurons. Each neuron is a cell (**Fig. 1**) that uses biochemical reactions to receive, process and transmit information. Treelike networks of nerve fibers called dendrites are connected to the cell body or soma where the cell nucleus is located. From the cell body, a single long fiber called an axon extends, which eventually branches into filaments and substrates and connects to other neurons through synaptic endings or synapses. Signaling from one neuron to another at synapses is a complex chemical process in which specific transmitter substances are released from the transmitter end of the junction. The effect is to raise or lower the electrical potential inside the receiving cell body. If the potential reaches a threshold value, an electrical impulse is sent down the axon, and the cell fires.

Scheme of transition to the neuron model

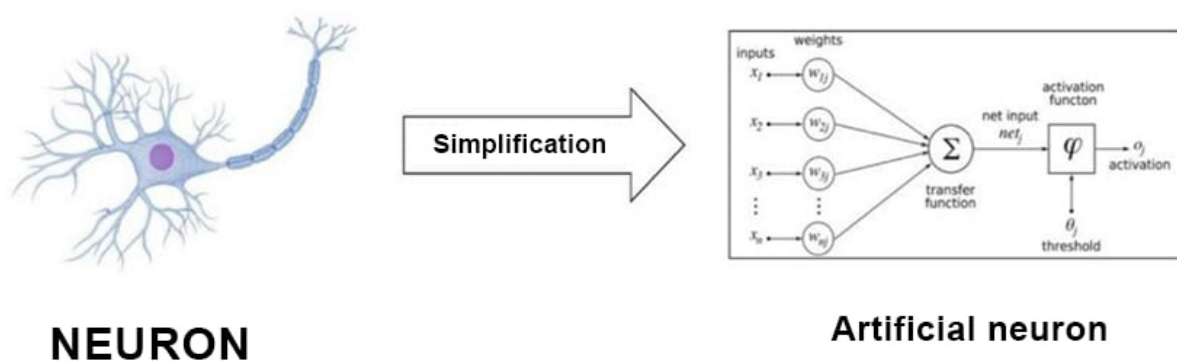


Fig. 1

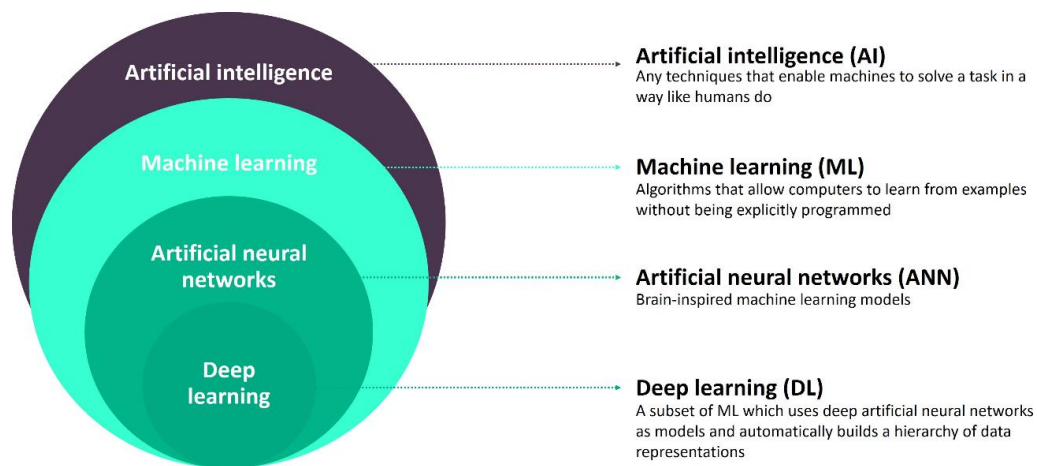
Artificial intelligence (AI; English Artificial intelligence, AI) - (1) the science and technology of creating intelligent machines, especially intelligent computer programs; (2) the ability of intelligent systems to perform creative functions that are traditionally considered the prerogative of man. Now, AI includes a number of algorithms and software systems, the distinctive feature of which is that they can solve some problems in the same way as a person thinking about their solution would do. The main properties of AI are language understanding, learning, and the ability to think and, importantly, act. Artificial intelligence AI is a complex of related technologies and processes that are developing qualitatively and rapidly, for example:

- ✓ natural language text processing
- ✓ machine learning
- ✓ expert systems
- ✓ virtual agents
- ✓ recommendation systems

This helps to build a qualitatively new customer experience and interaction process. There are two directions of AI development:

- 1) Solving problems related to the approximation of specialized AI systems to human capabilities, and their integration, which is implemented by human nature;
- 2) Creation of artificial intelligence, representing the integration of already created AI systems into a single system capable of solving the problems of mankind. Spheres of application of artificial intelligence technologies.

Technological directions of artificial intelligence (Fig. 2)



Directions of research in the field of artificial intelligence

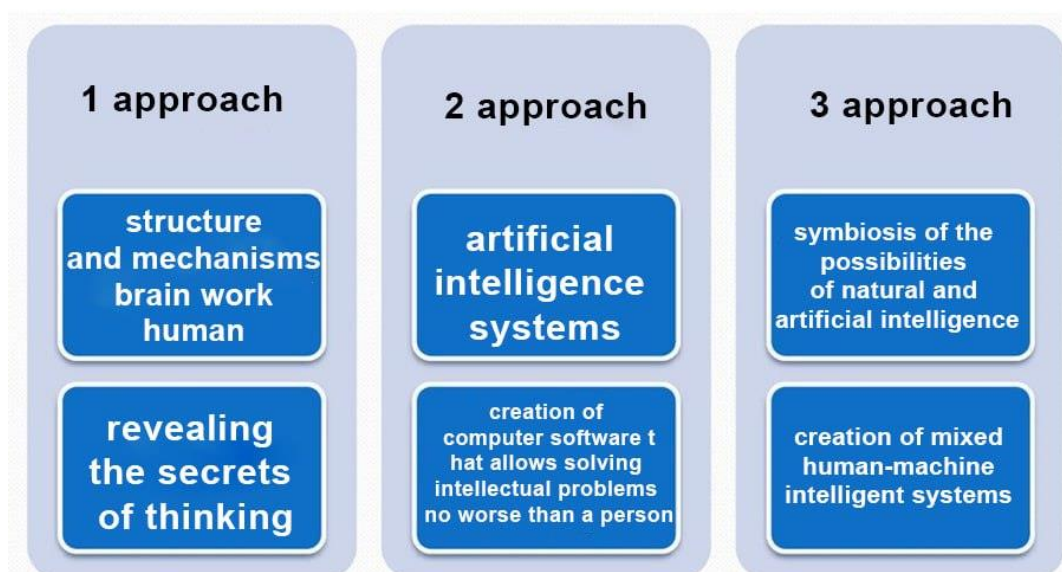


Fig. 2

1-Approach WHAT is the structure and mechanisms of the human brain?

The structure of the human brain is an organ of the central nervous system, consisting of many interconnected nerve cells and their processes. In the creation of AI, it is important to pay attention to the choice of the structure of neurons and their location in the design.

2-Approach WHAT are artificial intelligence systems?

An artificial intelligence system (AI) is a computer model of human intellectual capabilities in a purposeful search, analysis and synthesis of current information about the surrounding reality in order to obtain new knowledge about it and solve various vital tasks on this basis.

3-Approach WHAT is the symbiosis of the possibilities of natural and artificial intelligence?

There is a trend of the global impact of AI on the social sector, economy and business. High demand for intelligent virtual assistants. According to these principles, a neural network is created and trained, and eventually artificial intelligence is similar to human thinking.

question arises: What is the difference between artificial intelligence and neural networks?

I will try to answer in simple words Whether the developer eats, sells his product for a large amount, then this is Artificial Intelligence! If it doesn't eat a large sum, then this product wakes up like a neural network. This is, of course, the author's sarcasm.

CONCLUSION.

We understand that in one article on this topic it is impossible to tell completely, and I studied and tried to tell about the main basic parts of the functioning of the field of artificial neural networks.

Summing up all of the above, we must summarize that today, artificial intelligence technologies are still not fully understood due to the complexity of their systems, the ability to self-learn and change the behavior of machines. Of particular note is the collection of video surveillance data, various experiences of personal surveillance and then further violates the privacy of a person, so when considering the issue of further changing the status of artificial intelligence, the legislator should take a comprehensive approach to studying the advantages and disadvantages that artificial intelligence technologies have, the possibility of their negative impact on certain areas of their application, such as the possible negative impact on the availability of jobs for certain categories of workers whose functions can be performed by artificial intelligence. Questions remain regarding liability for artificial intelligence errors and their consequences, as well as the possibility of them being committed by artificial intelligence in general. Nevertheless, it must be recognized that in the world of continuously ongoing scientific and technological progress, where artificial intelligence plays an increasingly important role, it is necessary to continue studying these technologies in order to: firstly, determine their role and place in the future of mankind, secondly secondly, to designate the permissible limits for the use of artificial intelligence so as not to harm individual people or groups of people, thirdly, based on an understanding of the nature and principles of the work of artificial intelligence, transform legislation in such a way that it best meets the challenges that scientists face. -jurists have yet to face in the future.

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