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THE EVOLUTION OF ARTIFICIAL INTELLIGENCE: FROM THE TURING MACHINE TO GOOGLE DEEPMIND

Artificial Intelligence is taking up more and more space in our lives. Autopilots, chatbots, voice assistants and face recognition have become commonplace. But what does the term “Artificial Intelligence” really mean and how did it appear?

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving [2].

The aim of the given research is to analyse the main stages in the evolution of computer technologies, which were later called the “artificial intelligence”.

In 1936 the English mathematician Alan Turing published his works connected with the problems of creating devices that simulate human behaviour. Three years later on the other side of the planet, a biochemist Isaac Asimov introduced the term “robotics” and three laws of robotics. Other five years later, the mathematician Howard Aiken created the first automatic computer in the world “Mark 1”. The chain of these events forced the scientific community to create a smart machine that might be on a par with a person or even surpass him [3].

In 1956, the historic Dartmouth seminar took place, which was called "Artificial Intelligence", that is how the term was officially born. Just after the seminar, laboratories for the study of artificial intelligence began to appear in universities in Europe and the United States. For many years, scientists have noted that their creations cannot be thought of as a person. But despite this, they continued

to call their creations "artificial intelligence". The development of technology shows us that what was considered artificial intelligence a few years ago, today looks like an ordinary computer program. Modern AI is usually an imitation of individual functions of human intelligence, such as driverless cars, smart gadgets, and many other things that surround us in everyday life. Trying to find solutions, experts created artificial neural networks that were supposed to work similarly to the human brain. That means that the tasks assigned to them should be solved based on the experience they received. In this case, the most important characteristic of these machines was their ability to learn. Scientists approve that creating a model of the outside world, the brain uses large resources of memory and knowledge. This model includes all the person's experiences. Therefore, every time, forming forecasts about future events, the brain turns to a huge database, which is filled every day during our lives [1].

Today, the level of even the most complex artificial neural networks is somewhere in the area of insect intelligence. The question arises concerning the fact which part of our mind is missing in the computer calculations. During the second world war Alan Turing took an active part in the decoding of German ciphers, he was engaged in cryptanalysis of the famous German cipher machine "Enigma". Turing's approach was more general and based on the method of iterating through the source code for which he developed the machine "Bombe". The principle of operation of the Turing machine was similar to the operation of short-term human memory, and the memory cells were 108 rotating electromagnetic blocks. One this machine could do the job many times faster than the entire decoder team. Turing's approach to optimizing research in the decryption process was a new word in science, and it was his work that gave rise to the development of computing machines. In addition, Turing created a model of a well-known empirical test, by which a person during a conversation could determine whether a machine answers his questions or a person does.

Modern brothers of the Turing machine have appeared since that time. One of the world's largest software manufacturers and suppliers, IBM company has introduced a supercomputer called Watson. The computer consists of 90 servers. Each of them is equipped with four eight-core processors, and the total amount of RAM of all servers is more than 15 terabytes. The system has access to 200 million pages of information including the full text of Wikipedia. In February 2011, this supercomputer participated in the TV game “Jeopardy!”, where his rivals were the absolute record-holders of the game. Despite the fact that at the time of the competition, Watson was not connected to the Internet and using only information from his storage was able to win a prize of \$ 1 million. IBM is not the only company that is engaged in the development of artificial intelligence, Google has a whole staff of employees in its DeepMind division. They use the latest technologies to create learning algorithms, as well as working on the formation of intelligence, in order not only to implement it in machines but also to understand the work of the human brain. In solving the problem of artificial intelligence, Google DeepMind sees the creation of universal self-learning programs that are able to learn autonomously on different data and would be suitable for solving any tasks. At the moment, the company is engaged in research regarding computer systems that can play various games, from strategies to shooters.

Areas of application of artificial intelligence are quite wide. Today we can see how AI helps people solve many problems. For example, the health sector is one of the areas where the success of artificial intelligence is the most important. Even today, the IBM Watson supercomputer is able to detect deviations in human health. In about 30 percent of cases, Watson makes an additional diagnosis for the patient missed by doctors. Artificial intelligence differs from human intelligence: it does not get tired, it is not influenced by emotions and is able to process huge amounts of information during a short period of time. These are the advantages that make AI solutions effective in many industries.

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