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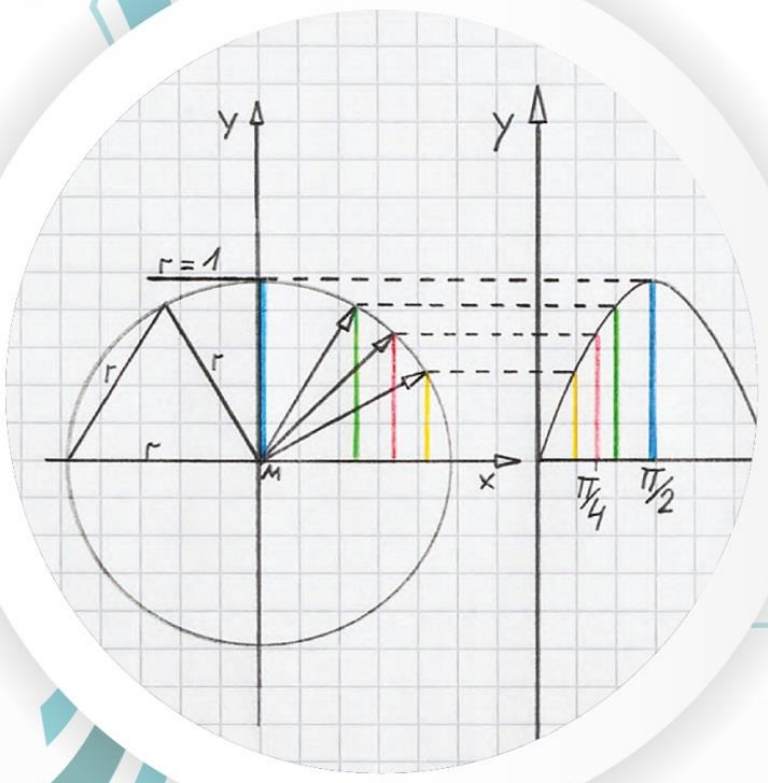

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BASIC PRINCIPLES OF ARTIFICIAL INTELLIGENCE

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Abstract: Intellectual information technology - computer science future brilliant And fast Steps With developing scientific And practical field This is considered from computers use With depends on All scientific And technological directions significant level Effect it shows society from science What pending If That one Today myself gives, practical important have was results, their Most of them their apply possible was in the fields fundamentally changes do capable

In the article artificial intellectual information technologies scientific in the foundation key component artificial calculation of artificial intelligence (AI).

Key words: Electronic count machine, information retrieval system, knowledge base, intellectual system, random access memory, database management system, communication system, artificial intelligence, artificial intelligence systems, technical means natural language, formal system, reverse chain of thinking, computer, expert system, new information technologies, software, database, explainer component, knowledge harvest do component.

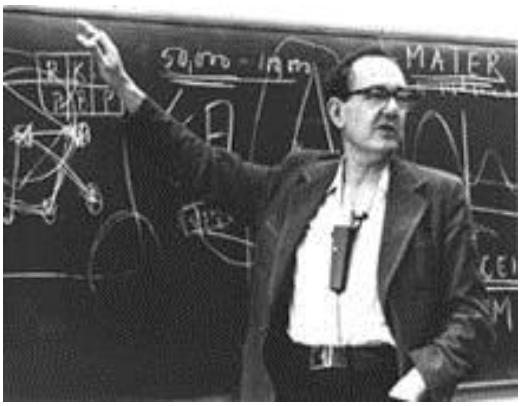
A set of concepts that enable computers to do things that seem reasonable to humans . What is the human mind? Does it have the ability to think? Does he have the ability to absorb and apply knowledge? Does it have the ability to share and work

with ideas? Obviously, all these abilities are part of intelligence. But this word cannot be defined in a simple sense. Because intelligence is the totality of knowledge in the field of processing and presentation of information.

The main goal of AI is to make computing machines more useful and to understand the principles underlying intelligence. Since one of the main goals is to make computers more useful, computer scientists and engineers need to know how SI can help them solve complex problems.


Allen Newell (1927–1992)

The beginning of research in the field of MSI (late 50s) is associated with the research work of Newell, Simon and Shaw on various problem solving processes. The result of their work was the "Theoretical Logician" and "General Problem Solving" programs, designed to prove theorems based on reasoning. These works marked the beginning of the first stage of research in the field of MIT. Also at this stage, various games, puzzles and mathematical problems were considered areas of research.


Herbert Simon (1916-2001)

In describing their program, Newell and Simon claimed that their program simulated human thinking. In the early 1970s, they published a lot of similar data and proposed a general way to build a program that simulates thinking. Although the work of Newell and Simon has received much attention, the mathematical and symbolic-logical approach to AIT research was developed by a group of researchers from the Massachusetts Institute of Technology, Stanford University, and the Stanford Research Institute [7].

John Clifford Shaw, (1922–1991)

Robinson's resolution method has been influential in AIT research. This method is based on proving theorems of predicate logic and is considered a perfect proof method. By the late 1960s, attempts were made to apply research to real problem environments rather than artificial environments, such as various games, puzzles, and math problems. Research into the operation of AIT in real conditions has led to the question of creating integrated robots. Carrying out such work can be called the second stage of research on AIT [6].

In the mid-1970s, laboratory-based robots were developed at Stanford University, the Stanford Research Institute, and several other places. Carrying out such experiments required solving a number of problems. Such problems include knowledge representation, visual perception, and natural language communication with robots. These problems pose more clearly defined challenges for researchers. This period became the third stage of AIT research. Its characteristic feature was not the creation of a separate (autonomous) working system that solves the problem assigned to researchers in a real environment, but the creation of human-machine systems that combine human intelligence and the capabilities of electronic systems.

Currently, competitive advantage is determined neither by the size of a country nor by its natural resources. Now it is determined by the level of education and the amount of knowledge accumulated by society. In the future, only countries that can create and acquire new knowledge will prosper . The main role in this is played by new information technologies, as well as AI methods and tools.

An intelligent system is defined as a voluntary biological, artificial, or formal system whose behavior reflects a goal-directed capacity.

The latter includes communication, knowledge gathering, decision making, learning, adaptation and other functions. Currently, there is a steady trend towards the

intellectualization of computers and their software (SW). The main functions of future computers are aimed at solving more non-computational tasks, that is, logical reasoning, managing BB, supporting intelligent interfaces and other tasks. The intellectualization of computers is carried out through the creation of special technical means (for example, neurocomputers) and DCs (expert systems, BB, problem solvers, etc.),

To form an understanding of the core technologies of AI, we need to study the implementation of its important concepts in software solutions.

Attempts to determine the structure of research in the field of SI have been repeated many times. The most popular views on this issue are presented in [5]. According to him, research in the field of SI includes two main directions:

• *bionics* deals with the problems of artificial restoration of structures and processes that underlie problems characteristic of the human mind and solved by man;

• *program-pragmatic* , deals with the creation of programs for solving problems that consider human intelligence (search, classification, learning, decision making, understanding symbols, reasoning, etc.) as a special right.

In the first direction, the problems of creating DT using artificial neural network models are considered.

Due to the complexity of the goals and problems of the bionic direction, until recently the programmatic-pragmatic direction dominated in AI, although in the future the bionic direction is likely to become decisive.

In the program-pragmatic direction, three approaches are distinguished:

• *local* , or *targeted* – creating for each task specific to a person's intellectual activity no less results that can be achieved by a person (for example, a game program for playing chess);

• *systematic* , or *knowledge-based* - currently this approach predominates, the creation of automation tools when creating programs for solving intellectual problems based on knowledge;

• description of tasks in natural language for creating intelligent programs using programming metaprocedures.

AITs are widely used in theorem proving, computer games, character recognition, decision making, adaptive programming, machine music writing, natural language processing, learning networks, and other fields.

Understanding symbols is one of the interesting intellectual problems; representatives of a variety of disciplines - physiologists, psychologists, mathematicians, engineers - have been solving such problems.

As a result of the widespread application of the results of theoretical research in practice, teaching automata, AI systems, medical diagnostic systems, criminal experiments, as well as robots that understand and analyze complex sensory situations have appeared.

1957, see American physiologist F. Rosenblatt. through proposed a perceptron model of perception and understanding . Persepron, imitating (simulating) the process of understanding, works in two modes: learning mode and understanding mode. In teaching mode, someone (human, machine, robot, or nature) plays the role of teacher, presents objects to the machine, and tells the machine which concept (class) they belong to. Based on this information, which is essentially a formal description of concepts, a decision rule is constructed. In the process of understanding, new objects are presented to the machine, and they are classified as accurately as possible .

The emergence of machines capable of learning concepts and understanding represented objects seemed interesting not only to physiologists, but also to representatives of other fields of knowledge, and this caused a large stream of theoretical and experimental research developments.

In the early 80s, “Expert Systems” emerged as an independent direction in the field of AI. ESs are the first step in creating practical AI systems.

Aliens are part of SI systems, which have theoretically played an important role in the development of this field. ES is the basis of AI ideas and methods that

visually use knowledge, data sets and the management systems that support them, as well as logical search, associative, computational operations and knowledge sources.

In conclusion, we note that the need to use intelligent systems often leads to the formation of ideas about their capabilities, principles of construction and directions of development.

The evolution of intelligent systems is growing rapidly. Some of them (for example, perception, ES, character recognition and classification, machine translation, speech recognition, etc.) are typical components for people working in a modern information and computer environment. Despite the fact that one of the main directions of intelligent systems is the widespread use of aliens in practice (in the USA, Japan and Europe), there are a number of unresolved problems that prevent their mass production and distribution.

- Creating an ES is still a long and difficult process;

- obtaining (acquiring) knowledge: sorting, structuring, describing, adjusting and tracking knowledge;

- problems that are often solved in life require solutions in different ways over time, many aliens: mainly because they are designed to solve fixed problems, they cannot be applied to other problems;

- lack of knowledge engineering software (since obtaining knowledge from an expert and formalizing it is the most difficult and responsible issue when creating electronic information).

Consequently, there is still a lot of work to be done to create ES and obtain results from them.

Others, which at the moment seem exotic and far from practical application, tomorrow will completely enter our lives.

Intelligent systems are based on research results related to many areas of knowledge. First of all, discrete mathematics, mathematical logic, cybernetics, mathematical linguistics, artificial intelligence , psychology, systems engineering and

others need to say. In addition, all the latest advances in programming technologies, the Internet, multi-agent systems, etc. are used.

As an example, the result of the interaction of intelligent information technologies and modern programming technologies is the Microsoft.NET platform, on the creation of which the corporation spent 2 billion dollars. more dollars have been spent and more than 5 thousand specialists are working on its development. New opportunities are acquired through the introduction of ideas and methods of artificial intelligence.

So, The basic principles of artificial intelligence are relying on knowledge, organizing communication in natural languages, understanding text, creating logical conclusions, justifying and explaining decisions, providing understanding and synthesis, and also creating conditions for the convenient use of various external devices.

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