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Development of artificial intelligence as a science

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Abstract: This article covers the development of artificial intelligence (AI) as a science and its historical progression from ancient times to the present. It explores the possibilities of artificial intelligence and highlights the contributions of scientists, both in our country and abroad, who have played a significant role in its development.

Keywords: Informatics, Artificial intelligence, computer, robot, Artificial, automation, machine, mind, society, science, humanity, intelligence, perspective, future.

Artificial intelligence is a branch of computer science founded in the 1950s. It was described at that time as a new science that systematically studied the phenomenon of the 'mind.' The goal was to accomplish this by using computers to simulate intelligent processes. In general, artificial intelligence aims to enable computers to imitate the human mind to solve complex problems and make decisions.

Artificial intelligence combines science and engineering to create machines capable of intelligent behavior. It integrates research and work from the fields of philosophy, psychology, and computer science.

Artificial intelligence is a branch of computer science that focuses on constructing and implementing intelligent agents as computer programs and comprehending the behavior of these entities. Cognitive science is an interdisciplinary field that encompasses artificial intelligence, linguistics, philosophy, psychology, and various subfields of other social and biological sciences. The overarching aim of cognitive science is to comprehend and model the human mind by leveraging the discoveries and methodologies of complementary disciplines.

Artificial Intelligence (AI) is the science of concepts that enable computing machines (HM) to perform tasks that appear intelligent to humans. What constitutes human intelligence? Is it the ability to think? Is it the ability to learn and apply knowledge? Is it the ability to share and collaborate on ideas? Clearly, all these capabilities are components of intelligence. However, defining this term in a simple sense is challenging because intelligence is a compilation of knowledge in the realm of information processing and representation.

John McCarthy, often considered the first author of this term, made the following comment at a conference held at Dartmouth University in 1956: 'Artificial intelligence' (AI, Artificial Intelligence).

The branch of science that studies "understanding" and related tasks is called artificial intelligence.

— The science and technology of creating intelligent machines, especially intelligent computer programs. Artificial intelligence is concerned with a task similar to using computers to understand human intelligence, but is not limited to biologically plausible methods."

In the beginning, scientists believed that creating artificial intelligence was purely a technical task. In the mid-20th century, with computers rapidly and accurately performing operations that were once the domain of humans (including the educated), the automation of thinking appeared to be a readily achievable goal. Developing 'machine intelligence'—whether in hardware or software—that automated numerous routine operations in manufacturing, scientific endeavors, and daily life represented a significant stride toward comprehending the nature of consciousness, among other aspects. The potential benefits and prospects are extensive. Scientists were challenged to produce a replicable artificial entity, be it in software or hardware, that could consistently replicate the valuable outcomes of human intelligence application.

In fact, work in this field began almost simultaneously with the advent of the first computers. Over the course of research, numerous significant results were achieved that enriched both science and technology. However, the history of this scientific domain is such that a single, universally accepted definition of the primary concept has yet to be established. Currently, there exist numerous distinct approaches to the study and comprehension of artificial intelligence. The most crucial task is to select two key areas.

- Artificial intelligence as a science is the study of mind design, encompassing the modeling of human thinking and computable search for meaning in data.
- Artificial intelligence, as a technology, enables intelligent processing of data (including self-learning, extracting relevant information, creating theories using mathematical logic, etc.) and the development of intelligent algorithms for systems design.

There are various schools of thought in artificial intelligence worldwide, differing mainly in their approaches and, consequently, in the direction of artificial intelligence development. This also influences the accepted understanding of the fundamental definition of this science in our country.

Artificial intelligence is:

1) The scientific field sets and addresses tasks related to hardware or software modeling of traditionally intellectual aspects of human activity.
2) Information technologies developed within this domain address the challenge of reproducing rational actions and thinking using artificial devices.
3) A characteristic of computer systems is solving problems traditionally assigned to humans and is related to creativity. However, the subject area for such systems must be necessarily delimited. The second part of the definition pertains to the field of artificial intelligence technology, as it encompasses the set of technologies enabling computer systems to acquire intelligent characteristics.

Thus, the main distinction between intelligent systems and traditional software task implementations is their ability to solve previously unencountered problems or those lacking a clear, general algorithm (e.g., decision-making in a dynamic environment).

The study of artificial intelligence commenced in various developed countries. In 1954, the seminar 'Automaton and Thinking' was initiated at Moscow State University, according to the renowned academician A.A. Lyapunov.

In the 1960s, V. N. Pushkin and D. A. Pospelov conducted a series of studies in the field of 'cybernetics' at Moscow University and the Academy of Sciences.

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A number of scientists have made significant contributions to the development of artificial intelligence in our country, including T.A. Khojakulov, N.T. Malikova with 'Artificial Intelligence,' Sh.A. Sadullayeva, D.F. Yusupov, F. Yusupov with 'Artificial Intelligence and Neural Network Technologies,' and H.N. Zaynidinov, T.A. Khojakulov, M.P. Atadjanov. They authored the books on 'Artificial Intelligence.' Currently, these publications greatly assist in advancing the field of Artificial Intelligence.

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