

УДК 004.838.2

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ARTIFICIAL INTELLIGENCE, PROSPECTS FOR ITS DEVELOPEMENT AND POSSIBLE TREATS

Artificial intelligence (AI) is intelligence demonstrated by machines, while natural intelligence is displayed by humans and animals and characterized by consciousness and emotionality. The traditional problems of AI research include

reasoning, knowledge representation, planning, learning, natural language processing, perception and the ability to move and manipulate objects.

General intelligence is among the field's long-term goals. Approaches include statistical methods, computational intelligence, and traditional symbolic AI. Many tools are used in AI, including versions of search and mathematical optimization, artificial neural networks, and methods based on statistics, probability and economics. The AI field draws upon computer science, information engineering, mathematics, psychology, linguistics, philosophy, and many other fields.

Early researchers developed algorithms that imitated step-by-step reasoning that humans use when they solve puzzles or make logical deductions. AI research had developed methods for dealing with uncertain or incomplete information, employing concepts from probability and economics. Moderate successes related to affective computing include textual sentiment analysis and, more recently, multimodal affect analysis.

In the long run, social skills and an understanding of human emotion and game theory would be valuable to a social agent. The ability to predict the actions of others by understanding their motives and emotional states would allow an agent to make better discussions. Some computer systems mimic human emotion and expression to appear more sensitive to the emotional dynamics of human interaction, or to otherwise facilitate human-computer interaction. Also, some virtual assistants are programmed to speak conversationally or even to banter humorously.

AI is widely used in robotics. A modern mobile robot, when given a small, static and visible environment, can easily determine its location and map its environment. Motion planning is the process of breaking down a movement task into "primitives" such as individual joint movements. Such movement often involves compliant motion, a process where movement requires maintaining physical contact with an object.

Artificial neural networks are an example of soft computing – they are solution to problems which cannot be solved with a complete logical certainty, and where an approximate solution is often sufficient. Other soft computing approaches to AI include fuzzy system, evolutionary computation and many statistical tools.

If an AI system replicates all key aspects of human intelligence, will that system also be sentient—will it have a mind that has conscious experiences? This question is closely related to the philosophical problem as to the nature of human consciousness, generally referred to as the hard problem of consciousness. David Chalmers identified two problems in understanding the mind, which he named the "hard" and "easy" problems of consciousness. The easy problem is understanding how the brain processes signals, makes plans and controls behavior. The hard problem is explaining how this feels or why it should feel like anything at all. Human information processing is easy to explain, however human subjective experience is difficult to define.

Are there limits to how intelligent machines—or human-machine hybrids—can be? A superintelligence, hyperintelligence, or superhuman intelligence is a hypothetical agent that would possess intelligence far surpassing that of the brightest and most gifted human mind. Superintelligence may also refer to the form or degree of intelligence possessed by such an agent.

Physicist Stephen Hawking, Microsoft founder Bill Gates, history professor Yuval Noah Harari, and SpaceX founder Elon Musk have expressed concerns about the possibility that AI could evolve to the point that humans could not control it, with Hawking theorizing that this could "spell the end of the human race".