

Artificial Intelligence from the Perspective of Dialectical Materialism

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Abstract

To explore artificial intelligence from the perspective of dialectical materialism, we must first answer the topical questions of artificial intelligence and explain intelligent robots, human-machine warfare and human-machine relations; At the same time, we must clarify our own views on the development of artificial intelligence and clarify the fundamental differences between artificial intelligence and human intelligence. Dialectical materialism highlights its own contemporary value in leading the development of philosophy, science, technology and engineering as well as artificial intelligence.

Keywords

Dialectical materialism; Artificial intelligence; Science and technology.

1. Introduction

Since the 20th century, artificial intelligence has been developing rapidly as a frontier science and interdisciplinary discipline, and is one of the landmark achievements made after more than half a century of technological development, which has caused strong effects and far-reaching impacts on all aspects of social life and even on the whole spectrum of human civilisation. Dialectical materialism, as the foundation of Marxist philosophy's worldview and view of nature, and as the scientific form of modern materialist philosophy, is of great theoretical and practical significance to the study of artificial intelligence, and will promote the dual development of philosophy and science in the field of artificial intelligence.

The exploration of AI from the perspective of dialectical materialism not only answers cutting-edge topics on AI, but also focuses on clarifying dialectical materialism's own view of AI and its contemporary values.

2. Dialectical Materialism Answers to the Hot Issues of Artificial Intelligence

"Alpha Go", developed by Google's research team, is the first artificial intelligence robot to defeat a human professional Go player and beat the Go world champion. On 15 March 2016, "Alpha Go" played the world Go champion and professional ninth-degree player Lee Sedol in a man-machine battle of Go, winning 4:1 on aggregate; on 27 May 2017, at the Wuzhen Go Summit in China, it played against the top-ranked world Go champion Ke Jie, winning by a total score of 3:0. The Go community recognises that "Alpha Go" has surpassed the top level of human professional Go. "Alpha Go" marks the beginning of a new IT era of artificial intelligence in computer technology, whose "intelligence" is approaching or even surpassing that of humans. The AI breakthrough in Go is an important milestone, and the man-machine war is vividly informing the world that AI has reached such a high level. This has led to a deeper consideration

of AI and the human-robot relationship (the relationship between humans and robots) from a philosophical perspective, especially from the perspective of dialectical materialism.

2.1. "Artificial Intelligence" and Its Essence

Since the third industrial revolution in science and technology, philosophers and scientists have been pondering the question: can humans make some kind of artificial machine think like a human being, can they create machines that mimic the structure of the human brain? There is no doubt that the answer is yes. Such artificial machines are today's artificially intelligent robots, the so-called "artificial intelligence". However, dialectical materialism states that artificial intelligence refers to the use of mechanical and electronic devices to replace and simulate the partial mental functions of the human brain, which is in essence an extension and simulation of the human mind. Artificial intelligence is merely thinking like a human being and not a human being, it is only an imitation of the structure of the human brain and not a replica, it cannot reach the peak of human brain thinking, let alone surpass it.

2.2. "Man vs. Machine and Its Substance

Generally speaking, the 'man-machine war' has two meanings. First, under capitalism, the alienation of labour leads to the alienation of science and technology, which in turn leads to the domination of machines over workers and the struggle between workers and machines. As Marx put it, "machines have the magic power to reduce human labour and increase efficiency, but they lead to hunger and overwork. By some strange and uncanny magic, new sources of wealth have become sources of poverty." "Machine work severely damages the nervous system while inhibiting the multifaceted movement of muscles and depriving all free physical and mental activity." The essence of this man-machine war is the workers' struggle against the capitalist relations of production. Its outcome was the disappearance of the bourgeoisie and the victory of the proletariat. In a real sense, this great machine became the mode of production of the working people.

The second is used in the context of artificial intelligence and, in form, refers to a competition, contest or even revolt between humans and intelligent machines in terms of intelligence and wisdom, while in content this is by no means the case. Any tool, including a machine, is essentially an extension of the human organ and its functional structure. "The natural object itself becomes the organ of his activity. He adds this organ to the organs of the body extending his natural limbs." This extension through the instrument as a medium is a relative, or external, extension; there is also an absolute, or internal, extension of the human organ and its functional structure. Here, man extends certain energies and functions absolutely from within the organs, not through implements, but through non-mediated channels such as training and education. For example, the enhancement of physical fitness through physical exercise and the improvement of thinking skills through cultural education are among the internal extensions that distinguish the use of external tools to extend natural forces. As a machine, artificial intelligence is naturally an extension of the thinking capacity of the human brain, rather than an internal and external extension. The essence of this man-machine war is a struggle between internal (absolute) and external (relative) extensions of the human brain, the result of which is not that one side defeats or destroys the other, but that the external (relative) extensions of the human brain take precedence and drive the development of the overall functional connectivity of the human brain, including the internal (absolute) extensions.

2.3. The "Human-Machine Relationship" and Its Identification

Since the dawn of time, man has been confronted with the eternal contradiction between freedom and necessity. In order to seek freedom and transcendence within the finite, mankind has had to constantly build and use many tools of production and engage in the practical activity of transforming nature. In the social practice of labour-based production, mankind has had to

adapt old tools and create new ones in order to overcome the complexity of his labour organs and to accumulate more and more wealth. From simple hand tools to steam engines, to electronic machines, to automatic control devices and finally to artificial intelligence, this is not only the history of the development of material tools, but also the history of the development of human society. As Marx said, the history of industry and the existence of the objects it produces is an open book on the essential forces of man and human psychology.

2.3.1. The General Nature of the "Human-Machine Relationship"

The fundamental nature of all material tools, including machines, as mediators of practice has never been and cannot be changed in the course of human industrial history and indeed of human development as a whole. Likewise, the fundamental status of the 'real human being' as worker, producer and practitioner as the subject of practice has never changed and cannot change. Thus, the general nature of the human-machine relationship is the interaction between the practical subject and the practical agent. Although artificial intelligence is the highest form of machine system, it is still a developmental aspect of material tools. It does not and cannot change its general nature as a practical intermediary; it must always be dominated by the practical subject.

2.3.2. Artificial Intelligence and "Inhumanity"

What is a human being? This question has puzzled philosophers and scientists throughout the ages. Using the basic position, perspective and method of historical materialism, Marx scientifically discovered the mystery of human nature for the first time in human history: human nature is not an abstraction inherent in a person, but in fact the sum of all social relations. Yet Engels, from the standpoint of dialectical materialism, scientifically pointed out in the *Dialectics of Nature* that the fundamental difference between man and other animals is labour. In other words, all real human beings are working human beings, and labour is the "class essence" of human beings.

It can be a product or an object of labour, but it is more of a mediator of labour. Artificial intelligence exists as a super-machine in a system of tools, it is one of the intermediaries of human practice, it is "non-human" and not human. Its relationship with human beings is in no way a relationship between the subject of practice and the subject, but rather a relationship between the mediator of practice and the subject.

2.3.3. Artificial Intelligence and "Parahumans"

The material mode of production is the form through which the practice of production of material goods operates. In terms of content, it is the way in which the productive forces and the relations of production are united in opposition; in terms of structure, it is the way in which the producers and the means of production are organically combined. In the production process, the producer is the subject and dominant, while the means of production are intermediaries or objects and passive, and there is a strict line between the two that must not be confused. The means of production can be the means of labour, the object of labour, the fruit of labour, but not the worker (the producer). Therefore, artificial intelligence qualitatively belongs to the means of production, and its change and development can only take place within the degree of means of labour, objects of labour and fruits of labour, and can never break through the threshold of this degree and qualitatively change into a producer. Therefore, artificial intelligence can never develop into a human being; it is not a 'quasi-human being'.

2.3.4. Artificial Intelligence and "Superman"

The human mind is the unity of the supreme and the non-supreme, and the human cognitive capacity is also the unity of the infinite and the finite, the absolute and the relative. As Engels showed, the human mind is supreme and at the same time not supreme; its cognitive capacity is infinite and at the same time finite. It is supreme and infinite in terms of the nature, mission,

possibilities and ultimate purpose of history, and non-supreme and finite in terms of the reality of each of its individual realisations. That is to say, human understanding and grasp of anything at any given stage is non-supreme, finite and relative.

The same applies to the human understanding of our own brains. Essentially, artificial intelligence is simply a simulation of the function of the human brain, a cognition and simulation of the material 'structure-function' of the human brain itself. However, humans will never exhaust this knowledge, nor will they ever achieve an absolute and complete simulation. Therefore, artificial intelligence will never reach the same level of human intelligence, let alone be upgraded to "superhuman" status.

2.3.5. Artificial Intelligence and "Human-like"

In a sense artificial intelligence can be seen as "human-like", "human-like" meaning "similar" or "approximate" In the same way that an "ape" is not an "ape", a "humanoid" is not a human or a "non-human", but it is like a human and has a similarity to human thinking in particular. "Human-like" is not human or "non-human", but it is human-like and has similarities to human beings, especially human minds. The emergence of the "humanoid robot" is a particularly remarkable confirmation and progressive deepening of the dialectical materialist view of the historical change in the basic structure of practice. Dialectical materialism states that the interconnection of the subject, object and mediator of practice forms the basic structure of practice, and that the historical changes in the basic structure of practice are concentrated in the two-way movement of the objectification of the subject through the mediator and the subjectification of the object through the mediator. The "human-like robot" mainly highlights the "subject-like" quality of the object in the field of artificial intelligence practice, and to a certain extent also illustrates the objectification tendency of the subject.

3. A Dialectical Materialist View of Artificial Intelligence

The dialectical materialist view of AI is a scientific view of AI, which analyses and answers the core questions of AI in its existence and development, reveals the fundamental differences between AI and human intelligence, and has groundbreaking contemporary significance for the new development of philosophy, science and technology, especially AI itself.

3.1. A View of Artificial Intelligence Development

3.1.1. The Essence of Artificial Intelligence Development: Machine Evolution

In the process of development, in order to constantly resolve the contradiction between freedom and necessity, between subject and object, human beings must constantly promote the evolution of material tools. The first industrial revolution achieved a leap from hand tools to machine tools, the second industrial revolution achieved a qualitative change from steam machines to electronic machines within the machine tool system, the new technological industrial revolution achieved a new breakthrough from semi-automation to full automation of machines, while the simultaneous intelligent revolution sought to achieve a new leap from fully automated machines to artificially intelligent machines. It can be seen that the birth of artificial intelligence is the result of the evolution of machines, and the process of development of artificial intelligence is the historical process of machine evolution.

3.1.2. Pathways for the Development of Artificial Intelligence: Structural and Functional Simulation

The development of artificial intelligence is mainly through two paths: firstly, "structural simulation", i.e. the use of electronic bionic technology to produce and manufacture "human-like brain" machines according to the internal structure of the human brain, in order to simulate the structure of the human brain; secondly, "functional simulation", i.e. the use of black-box methods that abandon the internal structure of the human brain and

simulate parts of its functions in terms of functional or behavioural processes. Due to the extreme specificity of the human brain and the limitations of modern science and technology, artificial intelligence is mainly realised through functional simulation, and even the most advanced technological engineering attempts to realise artificial intelligence through structural simulation are still far from real, full structural simulation.

3.1.3. Philosophical Foundations for the Development of Artificial Intelligence: Information Theory and Cybernetics

There are common laws concerning information and control between the machine as a practical mediator and the human being as a practical subject. Both have systems of information transformation and control, and their activities are expressed in the two-way control of the input and output of particular information. Information theory and cybernetics use a systems approach to structurally reveal the common laws of different systems such as machines and people. Accordingly, they are organically combined with computer technology to simulate certain functions and certain disciplinary activities of the human brain in the course of material practices, thus producing and developing the crucial practical outcome——artificial intelligence.

3.2. The Fundamental Difference Between Artificial Intelligence and Human Intelligence

There are some differences between artificial intelligence and human intelligence, and these differences will not be eradicated by the development of artificial intelligence. At most, they change the existing form of these differences. Among these differences, if there is a 'social-historical' one, then there is a fundamental difference between AI and human intelligence, which essentially distinguishes AI from human intelligence and limits the existing forms of other differences between them.

Artificial intelligence is the result of the evolution of a machine that subconsciously explores the social value and historical significance of the task or question itself during its operation, and is unintentionally aware of the social consequences and historical implications of the process when carrying out the command or task, i.e. AI is not socio-historical.

Human beings and their human intelligence are socially and historically united. As Marx mentioned, the individual is a social being, not a product of nature, but a product of history. Human wisdom emerges and develops in response to the needs of labour production and social practice, and it is gradually formed through social education and the absorption of the accumulated civilisational achievements of history. The special and three-dimensional social relations of human beings have created a colourful and subjective world of human beings, as well as a remarkable and profound human wisdom.

Human wisdom is able to reproduce the entire historical logic of the development of human thought, to take thought itself as the object of thought, to contemplate all social processes themselves as historical processes at the same time, and to realise more consciously its own sense of social responsibility and the subject's sense of historical mission.

4. The Contemporary Significance of the Dialectical Materialist View of Artificial Intelligence

4.1. Deepening Marxist Theory of Consciousness and Promoting Marxist Philosophy

The dialectical materialist view of AI has enriched the principle of the dynamic action of consciousness on matter, sounding and enriching Marxist theoretical thinking on the material unity of the world; expanding the field of research on consciousness theory, incorporating the principle of the dialectical relationship between man and machine into the Marxist system of

consciousness theory; opening up new propositions in scientific research on consciousness theory, highlighting the criticality of cognitive modes and laws of thought on the activity of consciousness and on the content of thought This has created a new world and a new kingdom in the field of Marxist philosophical research.

4.2. Deepening the Dialectic of Nature for Natural Science and Technological Engineering

The dialectical materialist view of artificial intelligence enriches and develops the Marxist view of nature, deepens the unity of the materialism, dialectic and value theory of natural dialectics, and highlights the dynamic, practical and revolutionary nature of natural dialectics. Therefore, the dialectical materialist view of artificial intelligence opens up the field of inquiry of the artificial nature view, accompanying and guiding the accelerated integration of information technology with robotics and robots and intelligent manufacturing technology in the new century, promoting not only the accelerated transformation of new natural science achievements into technological engineering, but also the response of new technological engineering needs and experiences to new natural science research, thus promoting a two-way vision of the artificial nature view, connecting the co-facilitation and collaborative development of artificial nature technology and artificial nature.

4.3. A Way Forward and A Scientific Approach for the Further Development of Artificial Intelligence

The artificial intelligence revolution was not quickly derived and applied by scientists after discovery in research, but was driven by industry. Therefore, how to integrate the various sectors of industry, academia and research has become an urgent issue. Deepen the reform of the science and technology system and establish a technological innovation system that is market-oriented, company-oriented and deeply integrated with industry, academia and research; insist on guiding innovation and promote the combination of industry, academia and research and the transformation of scientific and technological achievements. In addition, people's demand for convenience in production and life has driven the emergence and breakthrough of a new generation of information technology such as cloud computing, Internet of Things, mobile Internet and big data. The overall rise in labour costs in developed countries has driven the rapid development of smart manufacturing technologies, enabling robots to replace labour in an increasing number of fields. Finally, to cope with the smart revolution, we should nurture and develop new industries, accelerate innovation in the form of technology and products, and support the development of energy conservation and environmental protection, new-generation information technology, high-end equipment production and other industries. In accordance with the direction of high-end, intelligent, green and service, we should implement "Made in China 2025" and the 'Internet +' action plan, and actively develop the green service industry.

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