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PROGRESSIVE-ONTOGONISTIC PROPERTIES OF ARTIFICIAL AND NATURAL INTELLIGENCE

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Abstract:
This article discusses the emergence, history, stages of development of artificial intelligence and natural human thinking, the contrasting characteristics of natural and artificial intelligence. It also describes the essence, role, and significance of artificial intelligence in current philosophical teachings, and the spiritual and moral relationship of man with artificial intelligence.

Keywords: Artificial intelligence, human worldview, natural intelligence, computer revolution, information, security, cybernetics, neural systems, technology, robots, evolutionary development.

Introduction

In the current era of globalization, the role and scope of information technologies have become remarkably extensive, making it nearly impossible to operate in any field without utilizing computer systems and artificial intelligence. The emergence and development of artificial intelligence (AI) represent a revolutionary milestone in human history. Although the term “artificial intelligence” originated after the Second World War, today AI technologies and capabilities have far surpassed human intelligence in terms of expanding information databases, increasing data volumes, improving simple algorithms, optimizing computing power, and enhancing data storage systems.

The first research in the field of artificial intelligence began in the 1950s and was primarily aimed at solving problems and developing symbolic computation systems. In the 1960s, during preparations for the Cold War, the U.S. Department of Defense became one of the pioneers in employing information technologies to simulate human cognitive processes through technological means. As a result of these efforts, by the 1970s, several state-level projects were launched to create virtual street maps. Moreover, DARPA specialists succeeded, in the early

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years of the 21st century, in developing intelligent personal assistants designed not only for military purposes but also for civilian use.

However, these scientific research projects laid the foundation for cybernetic and formal logical principles employed in modern computer systems, particularly in decision-support systems and intelligent search engines designed to expand human capabilities. In these developments, moral and ethical considerations were largely neglected. Consequently, emotional experiences and affective states are virtually absent in any processes within artificial intelligence systems.

Although artificial intelligence is often depicted in science-fiction films and intuitive novels as a scientifically powerful force embodied in globally dominant robots, at the current stage of innovative development, AI technologies have proven to be neither frightening nor extraordinarily intelligent. Nevertheless, no matter how advanced artificial intelligence becomes, it can never surpass natural human intellect. It is true, however, that in certain social sectors, AI demonstrates higher labor productivity compared to individual human performance. For instance, the advancement of artificial intelligence brings tangible benefits to all areas of the economy.

Scientific and technological progress, along with the computer revolution of the mid-20th century, laid the foundation for a stable domain of scientific knowledge concerning artificial intelligence. However, efforts in this direction can be traced back to ancient and medieval times. Historical sources mention that even ancient Egyptians and Romans feared statues that could gesture or prophesy. Naturally, such phenomena were made possible with the direct involvement of priests, as these manifestations, if understood as purely mechanical or artificial, would have undermined the religious and spiritual dominance of the time.

During the Middle Ages, the concept of artificial intelligence evolved into an aspiration to create a mechanical thinking machine that could surpass human reasoning. Yet, religious superstition in both the East and the West, including within Islamic and Christian theological philosophy, significantly hindered the scientific development of the idea of artificial intelligence and artificial cognition.

Medieval philosophical and scientific literature contains references to the concept of the “homunculus”—a miniature artificial human believed to be capable of perceiving information from the surrounding world. The emergence of the first prototype of the computer in 1641 marked a new stage in human intellectual evolution. However, it also introduced certain invisible barriers to scientific, moral, aesthetic, spiritual, and axiological modes of thought. In later centuries, the globalization of the Internet gave rise to a profound moral crisis within society.

In the 18th century, the rapid development of technology, along with major achievements in the natural and exact sciences, greatly increased public interest in discoveries and inventions after the 1750s. Around the mid-18th century, the Austrian inventor Friedrich von Knaus, who served at the court of Francis I, created a series of machines capable of writing long texts with a pen. The advancements in mechanics during the 19th century provided new impetus for understanding the concept of modern artificial intelligence.

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In the 1930s, the English mathematician Charles Babbage concluded that a complex digital calculator—his analytical machine—could theoretically calculate moves in a chess game. Eventually, in 1914, Leonardo Torres Quevedo, the director of one of Spain's technical institutes, developed an electromechanical device capable of playing simple chess games against a human opponent. From the mid-1930s onward, discussions began about constructing devices capable of independently solving complex problems.

The issue of artificial intelligence gained serious attention within the global scientific community following the publication of works by Alan Turing (1912–1954), a British mathematician, logician, and cryptographer who made significant contributions to the development of computer science. In 1950, he proposed the Turing Test, designed to assess whether a computer could exhibit behavior indistinguishable from that of a human being.

During the Second World War, Turing successfully deciphered the intelligence code of the German "Enigma" encryption machine, marking a turning point in cryptographic history. In his landmark article "Computing Machinery and Intelligence", published in October 1950 in the journal Mind, Turing suggested a series of experiments to explore artificial intelligence. He argued that computers could be "taught" to think and communicate like humans through interaction—thus laying the foundation for machine learning and natural language processing. This experiment became known as the "Turing Test", which evaluated the degree of computer consciousness and the mechanism of artificial intelligence. As a conceptual counterpart to this test, the CAPTCHA system—widely used on the modern Internet to verify human users—was later developed to distinguish humans from machines.

Turing was also among the first to theorize the possibility of building a computer that could store programs in its own memory. Although he did not directly participate in the creation of the earliest computers we know today, his theoretical framework paved the way for their development. Furthermore, Turing designed one of the first computer-based versions of chess and conducted research in mathematics, biology, and chemistry, demonstrating his broad interdisciplinary vision and influence on modern science.

In 1956, the founders of cybernetics gathered in the United States to discuss the feasibility of developing a project known as "Artificial Intelligence." Among the conference participants were John McCarthy, Marvin Minsky, Claude Shannon, Alan Turing, and others. Initially, the concept of artificial intelligence focused on machines capable of performing specific human functions, such as language translation, object recognition, and making optimal decisions.

In our country, the field of artificial intelligence emerged nearly a decade later, replacing the cybernetic and bionic boom of the early 1960s. Bionics—a discipline combining biology and cybernetics—studied the structure and functioning of living organisms to design more advanced technical devices and systems.

The most actively developed methods of artificial intelligence include:

- Artificial neural networks
- Evolutionary computation
- Fuzzy logic and fuzzy set theory
- Expert systems

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• Cellular automata
• Multi-agent systems

We are now living in the era of nanotechnology. When people hear the word "robot," they often imagine human-like assistants capable of speaking, reasoning, and performing all tasks on behalf of humans. However, the concept is much broader. In fact, applications on your mobile device—such as Google Translate, digital dictionaries, and various interactive games—are also clear examples of artificial intelligence. They simply operate on a smaller scale, serving specific, well-defined purposes. Depending on the type of task you wish to perform, you use the corresponding AI-powered application.

At present, artificial intelligence consists of algorithms and software systems designed to perform a variety of tasks that typically require human cognition. The 1990s marked a new era in the development of AI. In 1997, IBM's Deep Blue became the first computer in history to defeat the world chess champion, Garry Kasparov. Another milestone in AI innovation was IBM's Watson supercomputer, which demonstrated the ability to answer questions formulated in natural language by drawing upon its vast data resources.

Modern AI applications have become integral to everyday life. Mobile assistants such as Siri and image-processing applications like Prisma are among the many achievements of artificial intelligence. Today, AI has become widespread, permeating nearly every aspect of daily human activity. For example, in the city of Yinchuan, China, residents no longer need bank cards—financial transactions are conducted entirely through AI systems that identify individuals by their facial features.

The question inevitably arises: are artificial intelligences truly thinking machines or conscious robots? The problem of automating the process of thinking is intrinsically linked to the very concept of artificial intelligence. The notion of a machine that can "think" is, to some extent, an extraordinary and paradoxical idea. At present, so-called "intelligent" machines — that is, those equipped with artificial intelligence — do not possess the ability to think at the same level as humans.

The highest level of performance they can currently achieve lies in their ability to quickly verify and process large volumes of complex data, scientific hypotheses, and mathematical theorems that would otherwise require enormous time and cognitive effort from humans. They are capable of analyzing thousands of specific and general cases under given conditions and producing results with remarkable speed and precision.

Despite media hype about android robots with "intellectual" capacities, their actual level of intelligence is roughly comparable to that of an average high school graduate. Nevertheless, there is no doubt that intellectual systems are increasingly becoming indispensable assistants to humans. They are particularly effective in easing tasks that require intense cognitive effort and play a vital role in ensuring safety and efficiency in many fields.

A vivid example of this can be found in information-analytical systems used at airports to coordinate flight operations. These systems integrate data on meteorological conditions, flight schedules, distances, speeds, and hundreds of other parameters to provide engineers and operators with optimal operational recommendations. The autopilot systems used in aircraft

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also belong to this category. During a flight, such systems can effectively take control of large airliners, ensuring smooth and stable operation — a task traditionally performed by pilots.

These systems are generally classified as expert systems. However, they function strictly within the framework of algorithms predetermined and programmed by developers. In situations not foreseen by these algorithms — such as emergencies or unexpected anomalies — such systems are unable to make independent, creative, or unconventional decisions. In such cases, the human pilot must disengage the autopilot and rely on personal knowledge, experience, and intuition to ensure safety.

Conclusions

Consciousness and thinking are the foundations of intelligence. Accordingly, the term artificial intelligence refers not to truly reasoning entities, but rather to machines capable of automated analysis — systems that can process information and perform evaluations, perhaps faster and with fewer errors than humans. However, such systems entirely lack creativity, morality, emotional perception, and purposeful intent. Moreover, it must be remembered that these artificial intelligences are themselves human creations.

Every computer — and thus every machine equipped with artificial intelligence — operates based on the binary numeral system, which consists of only two digits (0 and 1). This inherently limits the scope of operations that can be performed within its algorithms. When it comes to working with real numbers or performing approximate calculations, the binary system often proves inadequate, leading to computational inaccuracies and logical inconsistencies.

In 1991, the mathematician David Stoutemyer conducted a series of 18 computational experiments using computer software and demonstrated that all of them produced incorrect results — proving that computers (or artificial intelligences) are capable of making mistakes. This provides solid scientific evidence that artificial intelligence cannot solve every problem correctly.

Based on this, it can confidently be stated that artificial intelligence still cannot equal natural human intelligence. In certain specialized cases — particularly in mathematical computations — AI may surpass human capability, but only due to its superior speed rather than deeper understanding or reasoning.

Thus, the idea of a thinking machine or a fully conscious artificial intelligence remains, for now, a dream — one cherished by science-fiction writers and passionate, visionary programmers (enthusiasts, from the Greek énthousiasmos, meaning inspiration or divine excitement). While AI continues to evolve, the notion of it achieving genuine consciousness or creativity remains within the realm of imagination rather than scientific reality.

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