

## Will artificial intelligence replace humans?

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### Abstract:

The ongoing discussion surrounding whether Artificial Intelligence (AI) could surpass humans is greatly influenced by rapid technological advancements and the ethical questions they raise. AI's origins date back to the late 1940s, with pioneers like Alan Turing envisioning machines capable of cognitive functions. Key milestones, such as the 1956 demonstration proving machines with unlimited memory access could effectively solve any problem, marked significant progress in the field. The 1990s witnessed remarkable achievements in AI, notably IBM's "Deep Blue" defeating chess grandmaster Garry Kasparov in 1997, showcasing AI's prowess in specific tasks. With the surge in computational power, machines started outperforming humans in various domains, sparking debates about AI's potential to replace human roles. Technological advancements, including progress in big data analysis, deep learning algorithms, and internet connectivity, facilitated AI's expansion into new areas, enhancing its ability to independently analyze complex data sets. The emergence of the Internet of Things (IoT) further empowered AI systems by granting them access to extensive data repositories, thus enhancing their capabilities.

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While AI excels in tasks like data analysis and automation, challenges remain in areas requiring human qualities such as creativity, empathy, and ethical decision-making. Collaboration between humans and AI emerges as a promising approach, leveraging the strengths of both for faster problem-solving. While AI has the potential to excel in many domains, complete substitution of humans is unlikely due to the unique qualities humans possess. As we navigate the evolving AI landscape, careful consideration of ethical and societal implications will be crucial in harnessing its full potential for the benefit of humanity.

**Keywords:** Artificial Intelligence, technology, algorithm, internet

### INTRODUCTION:

The development process of artificial intelligence and the factors influencing this process encompass complex and extensive issues. This article discusses the history of artificial intelligence, its key developmental stages, the role of technology platforms, big data analytics, deep learning algorithms, internet integration, and operations in research and innovation. The history of artificial intelligence extends back to the late 1940s, when researchers like Alan Turing and John von Neumann attempted to formulate the concept of machines "thinking." In 1956, the idea of machines utilizing unlimited memory created a significant perspective for artificial intelligence. In the following years, the development of expert systems, machines learning from experience, and technologies enabling predictions based on collected data facilitated the real-world application of artificial intelligence. Starting from the 1990s, the growing interest in artificial intelligence culminated in symbolic events like the victory of the "Deep Blue" chess computer over Garry Kasparov in 1997, sparking engaging discussions [1]. During this period, machines began to replace humans in various fields by demonstrating higher performance with larger datasets. In the early 21st century, the rapid advancement of technology, the development of technology platforms such as big data analytics and self-managed systems, further enhanced the potential of artificial intelligence. This allowed computers to solve more complex problems and efficiently process larger datasets. In the most modern era, innovations in big data analytics and



management, deep learning algorithms, internet integration, high-performance computers, research, and innovation fields ensure the rapid development of artificial intelligence. Innovations in these areas reshape the functionality of entire societies and shape humanity towards a more automated and technology-adaptive society. The article raises questions about the potential substitution of humans by artificial intelligence and provides detailed information about these processes. Based on the topics discussed in this article, detailed information is provided about operations, research, and innovations related to the development of artificial intelligence through scientific articles and books.

## Will artificial intelligence replace humans?

Artificial intelligence (AI) and its potential to replace humans in various tasks continue to be subjects of ongoing debates, especially in light of recent technological advancements. AI encompasses technologies developed to perform tasks that typically require human intelligence, such as problem-solving, decision-making, and applying humanitarian skills. Discussions arise regarding whether AI will enhance collaboration with humans or eventually replace them. In this article, we will take a broad look at the history, development, capabilities, and the question of whether AI can replace humans. Understanding the history and development of AI is crucial before delving into discussions about its potential to replace humans. Let's now explore the history and development of artificial intelligence. The continuous development of modern AI, coupled with significant technological breakthroughs, is a pivotal aspect in describing the profound history and evolution of this field. Before the emergence of AI, pioneers in the field of Information Technology, such as Alan Turing and John von Neumann, aimed to elevate the concept of machines "thinking" to a higher level by attempting to prove the logical theorems of cognition. In 1956, researchers demonstrated that machines, when given unlimited memory access, could solve any problem, marking a significant milestone for AI. Subsequent years witnessed research efforts enabling the application of AI to real-world problems.[5] During this period, the development of expert systems, capable of learning from experience and making decisions based on accumulated data, became notable. Expert systems, which identify patterns and make decisions based on learned information, are widely used today in fields such as medicine and manufacturing. The development of programs like Shakey<sup>1</sup>, a robot, and Eliza<sup>2</sup>, which automated simple conversations, in 1965 paved the way for technologies later integrated into applications like Siri and Alexa<sup>3</sup>. Starting from the early 1990s, interest in AI began to rise, with computers demonstrating superior performance in tasks with narrow probabilities, such as playing board games like chess and checkers, surpassing human capabilities. This period saw advancements in computational power and data storage technologies, creating new possibilities for AI.[6] In the late 20th century and early 21st century, significant breakthroughs in computer hardware led to machines being able to solve complex tasks more efficiently. During this time, machines began to outperform humans in various tasks involving AI. A notable example is the victory of IBM's "Deep Blue"<sup>4</sup> over world chess champion Garry Kasparov in May 1997. "Deep Blue" had the capability to process two hundred million moves per second, surpassing human capabilities by a large margin. This event sparked widespread interest in AI among the public, leading to questions such as "Will artificial intelligence replace humans?" becoming prevalent. In 2005, a Stanford robot named "Stanley" autonomously won the DARPA<sup>5</sup> Grand Challenge by navigating a 131-mile course in an uncharted desert. Two years later, a team from CMU won the DARPA Urban Challenge by autonomously navigating through an urban environment while adhering to all traffic laws [10]. Comparing both victories, it becomes evident that the robot surpassed human performance by a significant margin. In the early 21st century, significant advancements in technology, knowledge, and engineering hinted at the potential values that could fundamentally alter human lifestyles. This period witnessed regulated developments driven by various factors such as the rapid increase in computing power, the creation of vast datasets, and the more effective development of machine learning. The evolution of AI constitutes the foundation of independent research and innovations in knowledge and

<sup>1</sup> Shakey - The first mobile robot that can think about its own actions

<sup>2</sup> Eliza - The first robot that can speak like a human

<sup>3</sup> Siri and Alexa – "Intelligent" assistants controlled by artificial intelligence

<sup>4</sup> Deep Blue - A robot specialized in the game of chess supported by the IBM supercomputer

<sup>5</sup> DARPA - A race organized for humanoid robots



technology. The creative activity of computers is strengthened with the emergence of new algorithms and technologies. This reinforces the ability of independent systems, such as machine learning, to become more complex and effective. Through the most advanced machine learning method, "deep learning," computers can learn, understand, and analyze more extensive and complex information. This enables personal assistants to become more intellectual and efficient, and medical diagnostic systems to become more accurate. These machines can analyze vast amounts of data without requiring human intervention. The development of the internet has facilitated the creation of more extensive and diverse datasets, offering the potential to transform various human activities in fields such as medical research, marketing strategies, and more. However, these advancements introduce ethical and emotional considerations, adding privacy concerns to the equation. All these innovations contribute to a more automated and intellectually oriented society. The automation of operational processes leads to increased speed and efficiency, fostering the learning of new skills. These changes and innovations reshape the functionality of all societies and fields, guiding humanity towards a more modern and technology-driven society. Now, let's examine the processes driving the development of artificial intelligence in the 21st century: The continuous evolution of artificial intelligence in the 21st century has been driven by processes that instigated widespread interest in AI.[8]

### **1.The Development of Big Data Analysis and Management**

The development of Big Data Analysis and Management has played a significant role in the advancement of AI. Big Data refers to the vast and varied volume of information generated continuously from sources such as social media, sensors, and digital transactions. This data is characterized by three primary dimensions:

**1.1.Volume:** Big Data involves massive amounts of information that can range from terabytes to exabytes. The exponential growth of data over recent years, as highlighted by sources like Intel, underscores its significance in contemporary information technology. The challenge lies not only in storing such enormous volumes but also in processing and analyzing them effectively.

**1.2.Velocity:** Data in the Big Data ecosystem is generated at high speeds. This rapid influx of data requires systems and technologies capable of capturing, storing, and processing it in near real-time. Traditional database management systems often struggle to keep pace with the velocity at which new data is produced and consumed.

**1.3.Variety:** Big Data encompasses diverse data types and formats, including structured, semi-structured, and unstructured data. These can range from traditional text-based information to multimedia files, sensor data, and log files. The ability to handle this variety of data is crucial for extracting meaningful insights and trends.

As a result, effective management and analysis of Big Data, encompassing its volume, velocity, and variety, require robust infrastructures and specialized tools. As technology advances, it remains crucial to extract valuable insights from Big Data, while also noting the significant role it plays in the development of AI. In today's data-driven world, this process remains essential for organizations striving for innovation and competitiveness.[2]

### **2.The Development of Deep Learning Algorithms.**

Deep learning algorithms represent a subset of machine learning, a branch of artificial intelligence. These algorithms are designed to analyze and comprehend complex and abstract data, drawing inspiration from the neurons in the human brain. As a fundamental processing principle, deep learning algorithms can independently analyze data, discern connections, and identify patterns. They learn from extensive datasets and apply this learning to new information. While deep learning algorithms find applications across various domains, their primary strength lies in their ability to handle complex and abstract information.

Key Characteristics of Deep Learning Algorithms:

#### **2.1. Neural Networks:**

Deep learning algorithms leverage complex neural networks, which are used in applications such as security surveillance, autonomous vehicles, medical diagnostics, text analysis, and more.

#### **2.2. Automated Operations:**

These algorithms autonomously regulate operations within neural networks, facilitating the automatic organization of analyzed data and enabling the automation of various business processes.



### **2.3. Autonomous Learning:**

Deep learning algorithms can learn independently over time. They adapt their decisions and outputs based on analyzed data, contributing to the development of continuously improving and self-regulating systems.

### **2.4. Multi-faceted Analysis:**

Deep learning algorithms perform multi-faceted analysis, enabling them to interpret and understand various types of data simultaneously. This capability allows for the analysis of images, audio, text, and other data formats concurrently.

These characteristics illustrate how deep learning algorithms, integral to the development of AI, enhance the capability to process and understand complex data, contributing significantly to advancements in various fields and industries.[1]

## **3.The development of Internet and Connectivity.**

The interconnection of various devices and sensors is referred to as the Internet of Things (IoT). The vast amounts of data coming through these devices provide more information to the activities of artificial intelligence. The expansion of the internet in this manner further widens the scope of artificial intelligence: [7]

### **3.1. Key Principles:**

- **Device Connectivity:** IoT<sup>6</sup> (Internet of Things) ensures the interconnection of various devices and sensors, allowing independent devices such as weather sensors, smart devices, and automated home systems to send and receive information to and from each other.
- **Data Collection and Sharing:** Through IoT-enabled devices, information can be collected and shared from the environment, manufacturing processes, and other diverse sources. This enables effective analysis and decision-making processes.
- **Protocols and Standardization:** Protocols and standards for connectivity are crucial for ensuring effective communication and connectivity among independent devices for the operation of IoT.

### **3.2. Role of Sources:**

- **Cloud Computing:** The extensive datasets from IoT devices are stored and managed in cloud computing infrastructure. This allows for the analysis, storage, and utilization of data on a broad scale.
- **Artificial Intelligence and Machine Learning:** Data from IoT-connected devices serves as a source for in-depth research and analysis for artificial intelligence and machine learning algorithms. This data enables algorithms to exhibit higher-level intellectual activities.
- **Application Areas:** The application areas of IoT are diverse, ranging from energy management to autonomous transportation, healthcare to smart cities. These application areas further expand the role of sources in a broader context.[4]

## **4.The Development of Technology Platforms.**

The development of high-performance computers, cloud computing, self-driving systems, and similar technology platforms enables artificial intelligence to operate faster and more efficiently. These platforms assist artificial intelligence in handling more complex and extensive datasets.

### **4.1. High-Performance Computers:**

High-performance computers are powerful and fast computer systems designed to perform complex computations and analyses. These computers ensure the faster processing of artificial intelligence algorithms and the analysis of complex data. The use of high-performance computers for artificial intelligence is crucial for research, mathematical modeling, and solving other complex problems.

### **4.2. Cloud Computing:**

Cloud computing operates on the principle of sharing information over the internet and delivering incoming data when and where needed. This platform facilitates the easy access of information from stored and managed locations and allows artificial intelligence applications to work with larger datasets. Utilizing extensive databases for artificial intelligence enhances the effectiveness of algorithms.[3]

**4.3. Self-Driving Systems:**Self-driving systems<sup>7</sup> are technologies that operate based on the principle of the self-control of machines and vehicles. These systems are equipped with sensors, cameras, and

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<sup>6</sup> IoT - connecting various devices and objects to the Internet and communicating with each other

<sup>7</sup> Self-driving systems - Common name for self-driving systems



algorithms that make autonomous decisions. The development of artificial intelligence in this field helps vehicles better understand their surroundings and achieve autonomous control.[9]

## 5.The Development of Research and Innovation.

Another crucial process accelerating the development of artificial intelligence is research and innovation. Research institutions, universities, and companies engage in activities to develop more effective algorithms, new technologies, and broader applications of artificial intelligence.

**5.1. Research Institutions and Universities:** Research and innovation play a leading role in the rapid advancement of artificial intelligence in scientific institutions and universities. These institutions conduct activities for the development of new algorithms, technologies, and research areas.

**5.2.Companies and Innovation Laboratories:** Companies and innovation laboratories are involved in research and innovation activities to expand the scope of artificial intelligence and create new application areas.

**5.3.Start-up Organizations and Innovation Ecosystem:** Start-up organizations provide an ideal ground for the rapid implementation of research and innovation activities. The innovation ecosystem enables the swift realization of research initiatives. In the preceding sections, we have examined the development process of artificial intelligence and the factors influencing this process. Now, let's attempt to answer the question, "Will artificial intelligence replace humans?"

## CONCLUSION:

Artificial intelligence is evolving to reduce and enhance human tasks in many fields. However, the complete replacement of humans by artificial intelligence is a highly complex question and can lead to various opinions. Many researchers and experts note that artificial intelligence can replace humans depending on the specific domain and purpose it is applied to. For instance, in automated processes, security measures, data analysis, and other areas, artificial intelligence can achieve significant successes and perform tasks on behalf of humans. However, in certain fields, human capabilities such as creativity, literary understanding, and independent thinking are challenging for artificial intelligence to fully grasp. Processes like predicting crucial information, solving complex problems, and making independent decisions are areas where artificial intelligence cannot completely replace humans. Even in domains where artificial intelligence has achieved remarkable advancements, it is crucial to consider humanitarian and social skills, ethics, and values. Human qualities like relationships, empathy, respect, and justice are challenging for artificial intelligence to comprehend. In general, it can be said that artificial intelligence has the potential to replace humans in many fields, but complete replacement may not be possible. Collaborative efforts between humans and artificial intelligence can contribute to faster and more effective problem-solving.

## REFERENCES:

1. A&E Television Networks, This Day in History 11 May 1997, Published Date: November 16, 2009, <https://www.history.com/this-day-in-history/deep-blue-defeats-garry-kasparov-in-chess-match>
2. Big Data Management and Analysis, Authors: Avita Katal, Mohammad Wazid and R H Goudar, Big Data: Issues, Challenges, Tools and Good Practices” , IEEE , 978-1-4799-0192-0/13 , 2013
3. Comparison of Several Cloud Computing Platforms, Authors: Junjie Peng, Xuejun Zhang, Zhou Lei, Bofeng Zhang, Wu Zhang, Qing Li, Published in: 2009 Second International Symposium on Information Science and Engineering by IEEE, <https://ieeexplore.ieee.org/abstract/document/5447227>
4. Evolution and Opportunities in the Development IoT Applications, Authors: Angel Leonardo Valdivieso Caraguay, Alberto Benito Peral, Lorena Isabel Barona Lopez, Luis Gavier Garcia Villalba, International Journal of Distributed Sensor Networks Volume 10, Issue 5, May 2014© 2014 <https://doi.org/10.1155/2014/735142>
5. Harvard University, Artificial Intelligence 2023, <https://www.harvard.edu/in-focus/artificial-intelligence/>





6. Harvard University, The Graduate School Arts and Sciences, August 18, 2017, The History of Artificial Intelligence, <https://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/>
7. Kinza Yasar, Gillis S. Alexander (2021), Internet Of Things(IOT), IOT Agenda. Retrieved 17 August 2021, <https://www.techtarget.com/iotagenda/definition/Internet-of-Things-IoT>
8. Kumar Abishek, 10 May 2022, <https://www.red-gate.com/simple-talk/development/data-science-development/introduction-to-artificial-intelligence/>
9. Sage Journals ,Authors: Daniel Corin-Stig, Dag Bergsjö, Anders Forslund, Ulf Hogman, Ricard Soderberg, Hans Johannesson, First published online December 12, 2012, <https://journals.sagepub.com/doi/abs/10.1177/1063293x12467808>
10. Stanford University, Journal of Field Robotics 23(9), 661–692 (2006) © 2006 Wiley Periodicals, Inc. Published online in Wiley InterScience ([www.interscience.wiley.com](http://www.interscience.wiley.com)), <http://robots.stanford.edu/papers/thrun.stanley05.pdf>

