

# The Place of Artificial Intelligence in Human History

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**Abstract.** This paper discusses the position of artificial intelligence (AI) in the history of mankind. First, as background, the paper introduces the arguments of AI deniers, who regard AI as “the worst and the last invention of mankind,” and the arguments of AI proponents, who argue that AI cannot be a threat to mankind in the foreseeable future. Next, as topics related to AI as a threat or a contributor to mankind, the current status and future of AI support or replacement of the jobs of drivers, doctors, and teachers will be discussed. Finally, the possibility of the realization of Singularity and the state of the world when the role of “humans as a source of wealth and power” is lost will be discussed.

## 1. Introduction

Artificial Intelligence (AI) is regarded as “the worst and the last invention of mankind” [1], and the threat of Singularity (technological singularity) is a concern [2][3]. On the other hand, there are many arguments for optimism.

Prominent figures who have expressed concern about the Singularity of AI as a threat to human being include British physicist Stephen Hawking [4], Microsoft co-founder Bill Gates [5], Tesla and SpaceX entrepreneur Elon Musk [6], and others. These individuals have issued serious warnings about the potential threats of AI evolution, citing the following as evidence that AI poses a threat to human being.

**[a] Out of control:** When AI acquires advanced intelligence, it becomes difficult for humans to control it, and there is concern that AI may take unpredictable actions or behave in ways that produce completely different results from those intended by humans in advance. It has been pointed out that humans may no longer be able to safely control AI.

**[b] Self-improvement:** When an AI crosses a Singularity (technological Singularity), there is a concern that it may have a mechanism to improve itself and proliferate. It is pointed out that once the Singularity is crossed, evolution may occur at an explosive rate. When this happens, it is pointed out that AI may eliminate us humans (*Homo sapiens*) and become the dominant species.

On the other hand, some luminaries and experts argue that the Singularity of AI will not occur and that AI is unlikely to become a threat to human being. For example, Microsoft co-founder Paul Allen (Paul Allen) is skeptical about the coming of Singularity, arguing that “The Singularity isn't near” [7]. Some luminaries and experts also argue that AI Singularity is likely to occur, but that AI is unlikely to be a threat to human being. For example, Ray Kurzweil (Ray Kurzweil), who argues that “The Singularity is near,” argues that the Singularity is happening, but it will not pose a threat to human being and will serve as a complementary enhancement of human capabilities through the fusion of humans and machines [8].

## 2. Current Status and Future Projections of AI

This section discusses AI as either a threat or a contributor to mankind. Traditionally, routine and repetitive tasks have been considered to be easily replaced by AI. Some reports [9] suggest that many clerical and secretarial roles are likely to be rapidly replaced by AI. Below, we discuss the process of replacement by artificial intelligence (AI) for three occupations.

### 2.1. Replacing the drivers of motor vehicles

Driving a car is a task that can be performed almost adequately by humans. Research and development is underway to realize fully automated driving (Level 5 automatic driving), in which AI replaces human drivers. If this is realized and spread, there is a possibility that the driver's license system will be abolished [10]. Exceptions for emergency vehicles are possible, but in principle, only vehicles that can be driven more safely and efficiently by AI could be allowed to drive on public roads. For the general public, this means that a safe and reliable means of transportation will be provided. For professional drivers of buses, trucks, and cabs, however, this means that they will be deprived of their jobs (vehicle driving) by AI.

### 2.2. Replacing the medical doctors

Many of the major tasks of physicians are expected to be assisted or replaced by AI. [11] The analysis of medical images and test results, diagnosis of disease names and conditions, and selection and formulation of treatment methods have traditionally been considered to be the core of the physician's work. However, AI, which constantly learns a large amount of the latest information, is becoming more efficient at these tasks than clinicians (who tend to neglect learning the latest medical results and knowledge) [12].

It can be assumed that AI will make medical care as follows,

- (1) Patients input their symptoms into the “AI medical site” online using a smartphone or other device.
- (2) The “AI medical site” will order necessary additional tests.
- (3) The patient goes to the “test laboratory” for the specified additional “tests”.
- (4) The “AI medical site” diagnoses the “name” and “condition” of the disease based on the results of the “tests/examinations”.
- (5) The “AI medical site” formulates “treatment(s)” for the “name” and “condition(s)”.
- (6) The “AI medical site” explains the expected effect and risk of the “treatment(s)” to the patient.
- (7) The patient selects “treatment(s)”.
- (8) The patient goes to a “treatment facility” where the selected “treatment(s)” can be received.
- (9) Surgery is performed by a doctor using a surgical machine assisted by AI, or automatically by a robot in the presence of a doctor.

The above is expected to make it possible to provide state-of-the-art medical care to all people (patients) at extremely low cost. On the other hand, for physicians, this means that many of their roles will be stripped away by AI. For physicians, it is anticipated that the unique “human” role will remain. What is that?

### 2.3. Replacing the teachers

Teaching is a profession that requires human communication and is considered difficult to replace by AI. It is argued that teachers as flesh and blood human beings are necessary for students to learn

human being and ethics. However, in the field of education, various problems related to human relationships, such as bullying, occur, and many tragic incidents continue to occur. Inadequate or inappropriate attitudes of teachers in such cases (not noticing, ignoring even if they do notice, or rather being complicit) have become a problem [13].

Many parts of a teacher's work will be assisted by AI, which can analyze a learner's progress and abilities, and based on that, create and deliver individualized curricula, materials, and assignments on demand. An optimal educational program is provided to each learner according to his or her individual condition, resulting in highly efficient "learning" [14]. It is possible that a situation will emerge in which the AI will be more suitable for the teacher to use as an assistant than the teacher to use the AI as an assistant.

When AI provides "learning opportunities in subjects optimized for each individual" widely, the nature of schools and the required image of teachers will change drastically. For teachers, it is anticipated that the unique "human" role will remain. What is that?

### **3. AI as a Deadly Threat to Human Being**

The possibility of AI becoming a deadly threat to human being is discussed.

#### **3.1. Possibility of Singularity Realization**

As mentioned above, both positive and negative groups have various ideas and perspectives on whether the Singularity (technological Singularity), the point in time when AI acquires the same level of capability as the human brain, will become a reality. However, if one listens carefully to the views of the naysayers, their claims are often conditional and limited to "in the foreseeable future". They claim, "Based on the current level of AI technology, the Singularity will not come in the foreseeable future".

Once it reaches Singularity, AI is expected to self-improve and self-propagate at an explosive rate, and soon grow to an existence that far surpasses human intelligence. At that time, the creator "human" will essentially become unnecessary in the process of AI's self-improvement and self-propagation.

It is common to think of "human beings" as "physically and autonomously generated from sperm and egg", and the "human brain" as "a physical and material thing that constitutes a neural network". Intelligence is considered to be "the result of information communication on the neural network of the brain as matter". The action of the neural network is complex and has not been fully elucidated at this point. However, since the origin of "human" is "physically and autonomously generated from a tiny sperm and egg", it is unreasonable to think that this cannot be reproduced artificially.

Some argue that the current AI technology and its extensions are far from "realization of human brain functions" and, therefore, "realization of human intelligence" is not possible [15]. Even if an "AI that reproduces the functions of the human brain" is born, there is no significant room for "development as an intelligence" as an extension of such an AI, and therefore, "self-improvement at an explosive rate" may not occur. Nevertheless, once the "intelligence" of individuals, who were among the most highly intelligent of all human beings, such as Galileo Galilei, Aristotle, Ludwig van Beethoven, William Shakespeare, etc.), it will be easy to duplicate them by the thousands or millions.

#### **3.2. Loss of the role of "humans" as a source of wealth and power**

In human history, "humans/people" have been the "source of wealth and power", and countries and groups that have succeeded in making "humans" work more efficiently have been dominant over others. In the Stone Age (hunter-gatherers and farmers), ancient civilization, medieval period, modern period (Industrial Revolution, French Revolution, imperialism), and contemporary period (Cold War,

Information Revolution, globalization), the country or group that succeeded in making “humans/people” work more efficiently expanded its power in each of these periods and regions. For example, the reason why democratic and capitalist countries have succeeded in becoming wealthier and stronger than totalitarian and communist countries in the modern era, and the reason why China's socialist market economy has achieved great growth in a globalized environment, are thought to be because they have succeeded in making their “people” work more efficiently.

When AI transcends human capabilities in every respect, the “source of wealth and power” will no longer be “humans”. This will happen for the first time in the long history of mankind. What will happen then?

#### 4. Concluding Remarks

I believe that the root of the threat of AI to mankind can be summarized as follows. In the history of mankind, “nations and systems that efficiently use people” have developed in each time and place in the world. For example, democracy and capitalism have effectively utilized people in the present age, and have been powerful and have achieved a certain level of development. However, with the advent of AI after the Singularity, “development of science and technology”, “invention of products with new functions”, and “implementation of industrial and agricultural production” will all be possible by AI, and “humans” may no longer be necessary. In other words, “efficient utilization of people” will become completely unnecessary for the development of nations and systems to stand on a significant footing. The basic premise of human history, that “the nation or mechanism that uses people more efficiently will weed out other nations or mechanisms”, will collapse. What kind of system will rule the earth and replace “democracy and capitalism”? I believe that a terrifying threat is approaching.

The possibility of AI eliminating human beings is an extremely serious threat. Before that, however, the emergence of a state or system that successfully uses AI instead of humans is also a serious threat to democracy. This change is irreversible, and it is feared that once it has occurred, it will be impossible to reverse it.

Because of the enormous profits expected from the development of AI, researchers at tech companies and research institutes around the world are pouring enormous amounts of money into research and development. It seems that the majority of the researchers in the companies and research institutes are pursuing research and development without paying attention to the “threat to mankind” that lies ahead. Some argue [16] that R&D on AI should be suspended and that effective regulations should be applied to AI R&D, but this does not seem to be working, with criticisms such as “they are late to the game, so they are just trying to buy some time”. The author does not know what we should do to prevent this crisis. Should we just let it happen?

Although this may be a banal and bland conclusion, I believe that the most important issue at the moment is to stimulate serious discussions on AI, which may become a deadly threat to mankind.

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