

## From Human Intelligence to Artificial General Intelligence

The launch of ChatGPT in November of last year has generated much curiosity and concern worldwide. Therefore, OpenAI representative Sam Altman has been traveling to various countries to address concerns and suggest that governments establish regulations regarding the development and use of artificial intelligence.

As we know, natural human intelligence has evolved and accumulated knowledge and experience since time immemorial. And our evolution has not been peaceful, but rather dominated by a constant cycle of wars caused by human ego and the desire for power to conquer territories or impose political or religious beliefs on others.

In the course of this evolution, humans have created tools to face the challenges of their existence in the natural environment, but at the same time, these tools have been used to cause harm. Let's take fire as an example, which, when discovered, protected us from the cold and allowed us to cook food. But it was later used to burn people at the stake for having a different belief than the prevailing religion.

Now we find ourselves in the midst of rapid development of artificial intelligence, which is a tool designed to mimic the capabilities of the human brain and is currently in its infancy. However, it is learning at an accelerated rate as more sophisticated computational languages (large language models) are developed, moving towards a more advanced phase known as *Artificial General Intelligence (AGI)*. This may be the last of all the tools built by human intelligence to facilitate all tasks and radically transform our way of life.

It is important to note that human intelligence has taken millions of years to learn and become aware of its natural environment, while artificial intelligence has reached a surprising level of development in a span of 52 years since the introduction of the Intel 4004 microprocessor (1971), a chip designed for arithmetic operations in desktop calculators.

Artificial intelligence emerges by replicating two fundamental functions of the human brain: the ability to process information (arithmetic and logical functions) and the ability to store that information (memory function). For this purpose, computer programs (software) were developed, consisting of instructions in binary language to perform specific tasks on tiny chips (hardware).

In 1981, 10 years after the introduction of the 4004 chip, IBM launched the PC 5150, giving birth to the era of *Personal Computers or PCs*. IBM built its model using Microsoft's MS-DOS operating system and Intel's 8088 chip, departing from its traditional style of producing its own equipment. This created an open structure that allowed other companies to produce their own PCs.

The introduction of the PC spurred the development of *distributed computer systems*, which consisted of a group of personal computers (processor-memory) communicating with each other through a local area network (using coaxial cables) within a physical space such as an office, university, factory, or other geographic area. Later, with the development of the Internet, PCs were able to connect globally.

It is worth noting that the PC also initiated a process of *decentralizing computing*, which until the 1980s was dominated by enormous computers known as *mainframes* (centralized systems) accessible only to research centers, military projects, and large corporations. With the PC, citizens everywhere began to have access to computers.

With cutting-edge developers like Microsoft, practical software programs such as Word (1983), Excel (1985), and PowerPoint (1987) became popular. These incipient artificial intelligence programs allowed humans to perform specific tasks at home, school, or in the workplace. In other words, these programs initiated a process of interaction between natural intelligence and artificial intelligence, between humans and machines.

In the late 1990s, internet search engines appeared, marking a new milestone in the development of artificial intelligence, as computing devices transitioned from executing text, calculation, and slide presentation functions to answering specific questions based on information available on the internet. Undoubtedly, the most popular and successful search engine was developed by Google in 1998 and has dominated the market until the emergence of ChatGPT in November 2022.

Unlike search engines, ChatGPT is an artificial intelligence tool created not only to answer specific questions but also to engage in conversations with the user. It can create poetry, edit texts, or generate summaries, essays, or reports on any topic, among other functionalities. ChatGPT consists of the English term "Chat," which means to converse, and the acronym "GPT," which stands for Generative Pre-trained Transformer.

This device was launched by OpenAI and represents a new technological wave known as *generative* artificial intelligence, as it uses machine learning techniques and natural language processing. It is based on an algorithm that sequentially constructs meanings from natural language words and has been trained on a wide range of information sources, including books, articles, websites, and more.

In March 2023, OpenAI released ChatGPT-4, an updated version of ChatGPT-3.5 launched in 2022. ChatGPT-4 introduces a higher level of accuracy compared to its predecessor, although it may still provide incorrect or invented information (hallucinations) and exhibit social biases, so users should consult and verify with alternative and reliable sources.

However, this new version has novel features such as facial recognition of the user to analyze their expressions and emotions, as well as image recognition. We can anticipate that future versions will deploy not only text but also a range of multimodal technology (several modes of communication) that will allow user interaction with images, videos, and audios, similar to how it is currently available on computers, tablets, or smartphones.

For the time being, ChatGPT remains an AI tool limited to specific tasks, but it has initiated intense competition among tech giants like Microsoft and Google, which have produced their own versions of ChatGPT with the aim of dominating the artificial intelligence market. Additionally, major Chinese technology companies like Alibaba, Baidu, and Tencent have also created their own chatbots under the control and supervision of the Chinese government, while the Japanese

government is supporting the private sector in developing its own AI ecosystem to not relying solely on OpenAI's ChatGPT.

Undoubtedly, the race for AI dominance will accelerate the transition towards *Artificial General Intelligence (AGI)*, leading to the emergence of autonomous machines with the ability to learn, understand, and perform various tasks carried out by humans. Once this threshold is crossed, we will have millions of machines communicating with each other and transferring knowledge and information about their environment instantaneously.

Given this scenario, a plural number of AI experts have expressed concern about the existential risks posed by this technology if it falls into the hands of malicious actors or if it acquires autonomy by itself. Therefore, they have recommended a pause in AI development and have called on governments to establish proper regulations for this sector.

In this regard, China began the process of regulating AI in April, and the European Parliament approved legislation on this matter in May. In the United States, hearings have been held in Congress, and the White House has listened to the opinions of major AI companies. However, there is still no consensus in the US to regulate AI, nor has any international cooperation scheme been advanced to control its risks, due to geopolitical tensions between the United States and China.

The truth is that we are inevitably moving towards AGI, including the future integration of artificial intelligence with the human brain through the implantation of chips, which is currently in the experimental stage for medical purposes.

From now on, the world's academia, industry and governments will have to strive to align the goals of the AGI with the preservation of human existence. Still, there is no guarantee that this alignment will maintain human control over machines.

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## **Notes**

I would like to express my gratitude to Mrs. Ayana Díaz Hatada for translating this article into Japanese.

My articles are food for thought and are intended for family, friends, acquaintances, and ordinary citizens. The goal is to encourage reflection and stimulate discussion on current topics.