

New Thinking on Artificial Intelligence and Economic and Social Changes Combined with Singularity View

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Abstract: After the concept of "singularity" was put forward, the debate on the possibility of artificial intelligence gaining subject "consciousness" and the threat to the sustainability and subjectivity of human species has intensified. From the historical development of modern artificial intelligence, this paper analyzes the two "contradictory" attitudes of human towards artificial intelligence, and then summarizes and puts forward some new thoughts on this basis. This paper analyzes the positive effects of artificial intelligence on the economy and society, and draws a conclusion that the economy will continue to benefit from the development of artificial intelligence and may reach the economic singularity from the perspective of the continuous expansion of artificial intelligence application scale and AI big data market. This paper argues that there is no sufficient and reliable evidence for the arrival of the singularity that machines possess "subject consciousness", and the value of new thinking brought by this argument is worth paying attention to. For the accompanying challenges to social order, the government needs to adopt reasonable policies, control the scale of artificial intelligence through financial guidance, fiscal expenditure and other means to maximize social welfare, and at the same time, increase redistribution efforts and improve the social security system.

Keywords: Artificial Intelligence; Singularity; Subject Thinking; Economic Society.

1. Introduction

Artificial intelligence is sweeping the world. The rapid development and wide application of the technology is accompanied by a revolutionary impact on human society. Artificial intelligence, which can replace human physical and even mental labor, has become an important part of the fourth Industrial revolution [1]. People hold different attitudes towards the explosion of artificial intelligence. Optimists accept the possibility of subjectivity and singularity of artificial intelligence in the future based on the advantages of artificial intelligence replacing repetitive work, improving production efficiency and promoting the improvement of products and services. However, pessimists worry about the uncontrollability of human beings and various social problems that may accompany artificial intelligence once it gains subjectivity or the "singularity" truly arrives.

2. Literature Review

For the future of human beings under the explosive development of artificial intelligence, many scholars have put forward different views based on multiple perspectives. Cheng Chengping [2] denied the possibility that consciousness as immaterial could be possessed by artificial intelligence as material, and believed that artificial intelligence could only simulate thinking, so it could not become the subject of human concept. What can truly realize the "singularity" is human-machine combination rather than a machine lacking thinking. Tu Liangchuan and Qiao Liang [3] believe that the key to whether artificial intelligence will acquire subjectivity lies in the quasi-subjectivity of artificial intelligence created by human beings. We should seriously rethink the nature of the subject and how to continuously confirm, generate and enrich the self in the era of artificial intelligence. Huang Xinrong [4] puts forward the idea that "singularity" may appear in the era of new artificial intelligence, and believes that the difficulties and problems

brought by it are temporary. Intelligent machines will not evolve into a new species or enslave human beings, but will always create wealth and improve social welfare for us without human selfish desires, which is a new ecology of man-machine coexistence.

Many scholars have also studied the influence of artificial intelligence on economic and social development. Xiao Han and Ge Wei [5] defined the economic singularity as sustained and steady economic growth, built a three-sector dynamic equilibrium model to explore the impact of government investment and redistribution policies on the economic singularity, and got the conclusion that artificial intelligence will make our economy reach the singularity in 2066. Cao Jianguang [6] innovatively analyzed the user big data of service robot, a branch of artificial intelligence, by taking the COVID-19 epidemic in 2020 as an exogenous natural experiment, and found that external public health events increased people's consumption of artificial intelligence products, thus promoting the development of related industries, which greatly increased the probability of the emergence of "economic singularity" of artificial intelligence. Huang Xu and Dong Zhiqiang [7], by expanding the generation alternations model and constructing the production model of traditional material and artificial intelligence sectors, found that the long-term economic development would be stagnated if the scale of artificial intelligence sector was not controlled. For labor-intensive countries, investment in AI capital should be increased in the early stage of development, and taxation should be reduced in the initial stage to promote development, and then taxation should be increased after reaching a certain scale. Capital-intensive countries should control the scale of AI through taxes and other measures.

3. Modern Artificial Intelligence from Man-machine War

The result of the human-computer Go competition held in

South Korea in 2016 shocked the world. The world Go champion Lee Sedol was defeated by Google's artificial intelligence robot AlphaGo, which may have attracted the most attention in the world in the 60 years since the development of artificial intelligence. Meanwhile, the "man-machine war" originated from chess and Go more than 20 years ago is also an important opportunity for artificial intelligence to be recognized by most people [8].

3.1. The Birth of Artificial Intelligence was the First Low Point

Human history goes back many years, at that time, the physical and mental labor of the society are very heavy, people hold the hope of looking for labor replacement began to try to use machines to simulate human thinking, but limited by technical conditions, until the emergence of automation, computer, modern artificial intelligence cannot be developed. People placed high hopes on the birth of artificial intelligence, thus setting off the first wave of development, and the expectation of surpassing human intelligence is placed on the development of artificial intelligence within ten years. However, the reality is that after decades of development, the intelligence degree of artificial intelligence is very low, and there is no value to be popularized, so related research has fallen into a trough.

The development of the first generation of artificial intelligence fell into a low tide mainly due to the limitation of storage capacity and computing speed. At that time, the machine imitated and learned human intelligence mainly through people's programming. However, this kind of learning method, which set aside experience and deduced limited human behaviors by reasoning, was not really creative [4].

3.2. The Rise and Fall of the Second Generation of Artificial Intelligence Represented by "Deep Blue"

The emergence of expert system revived the development boom of artificial intelligence in the early 1980s. Expert system could perform mental work as human experts in some fields. At that time, people predicted optimistically that machine experts would replace human experts. Compared with the first generation, the introduction of the knowledge base of the second generation of artificial intelligence makes the machine surpass some experts in some fields of knowledge and query ability. "Deep Blue" defeated the chess champion Garry Kasparov more than 20 years ago, which is a typical example. Although the machine introduced into the knowledge base can simulate human experience, the knowledge base is closed, static and limited, so the expert system still cannot compare with the human brain, which can constantly learn and think. The development of the second generation of artificial intelligence once again fell into a low tide.

3.3. The Third Generation of Artificial Intelligence, Represented by AlphaGo, has Attracted Much Attention

In 2016, AlphaGo won a series of world Go champions, and people began to realize that the "experience" and "wisdom" of artificial intelligence could surpass human beings in some aspects. The reason why AlphaGo is impressive is that the third generation of AI can self-induction, learning and

adaptation under the support of big data and deep learning technology, and adapt to new problems according to big data experience, and overcome the limitations of the first two generations and show human wisdom[9]. As the most publicized epochal event in artificial intelligence, 2016 has been called the first year of the new artificial intelligence.

After more than 60 years of several ups and downs in the development of artificial intelligence, it has brought great shock to mankind, but also caused controversy and concern from all walks of life: The monopoly of human thinking on consciousness has been broken by a "new species" that is equal to or even beyond human intelligence. Intelligent machines have the ability to "think" actively, instead of just low intelligence and passive cooperation with human beings. The relatively harmonious man-machine relationship has been broken, and the enslavement of human beings by this new species is worrying and thoughtful.

4. The Singularity is Coming

The first two generations of artificial intelligence due to the limitations of the low degree of intelligence, and machine technology automation in the form and content of a large overlap, so in the course of these two generations, people tend to cheer for the development of artificial intelligence, because from the point of view of human, relative to the machine is the absolute subject. When artificial intelligence develops into the third generation, belonging to the "high-level automation" and the "imitation" ability of human intelligence reaches an astonishing degree. With explosive growth in intelligence and speed, it may produce consciousness and thinking ability. Due to the shaken subject status, human beings begin to worry that the next development of artificial intelligence may achieve achievements beyond human beings. The "singularity" is the extreme situation where artificial intelligence can no longer be controlled by humans.

4.1. Knowledge of Singularities

Ray Kurzweil is the most famous person who proposed the "singularity" in the field of AI. In his book *The Singularity Approaches*, the "singularity" proposed refers to a period in the future when the speed of technological change will increase exponentially by double, and will no longer be limited by the growth of human intelligence, and "surpass" human intelligence in many aspects [10]. At this time, human technology will be combined with the knowledge in the human brain, human-machine civilization will surpass the limit of the human brain, and the combination of traditional human intelligence and machine intelligence will gain double advantages. Nano-robots designed at the micron scale at the molecular level, such as robotic red blood cells, can perform many functions in the human body, including delaying aging, and machines can fully "understand" human emotions, a trend that will eventually lead to non-biological intelligence. The law of accelerated regression will continue until computational optimum patterns of matter and energy are reached, at which point human civilization will spread throughout the universe, expanding even faster than the speed of light, and humanity will determine its own fate. To be extended to this paper, the economic singularity of artificial intelligence refers to the high-quality development mode of sustained, steady and accelerated economic growth.

4.2. Opposing View

For the singularity of artificial intelligence, there are many

opposing views from all walks of life. The first view is that the mind and brain are inseparable, that is, the mind is restricted by the brain, and only in line with the strong form of dualism -- the mind and brain are separated in concept and experience, and the representation of psychology can exist through writing and running programs. Therefore, AI cannot truly reproduce psychology, and singularities cannot occur. The second view holds that from a philosophical point of view, the strong assumption realized by the singularity of artificial intelligence is strong computation, while computation is only a part of human brain. Therefore, compared with the "strong computation" human brain, artificial intelligence belongs to "weak computation", and the world is not completely computable [4]. The third voice holds that all object functions are highly related to its structure, and artificial intelligence does not have the biological basis of human brain. It is impossible to abandon this emphasis and imitate human intelligence and achieve comparable achievements, because the basis of consciousness is life.

4.3. Summary

This paper argues that whether the singularity of artificial intelligence can emerge or not, we should pay more attention to whether the machine can have subjectivity in the future development. This subjectivity refers to a form that can compare with or even surpass human beings in the autonomy of consciousness. However, whether the autonomy of consciousness can be realized in the machine is still an unsolved mystery. From the perspective of the realization of machine subjectivity, it may be too early to judge whether the singularity is near. It is still necessary to study the conditions and basis of the generation of consciousness subjectivity like human brain from the perspective of more disciplines, and conduct scientific research through the analysis of more empirical data.

It has become a reality that artificial intelligence has had an unprecedented and significant impact on human economy and society. Compared with the view on the future of artificial intelligence, what is the core of human to maintain the dominant position? Is it possible that the "consciousness" of AI is a new "consciousness" independent of human beings [3]? Man-machine coexistence will become an inevitable trend, how should human beings constantly "upgrade" themselves so as not to be eliminated by the new era of artificial intelligence? These questions may also be worth thinking about.

5. The Impact of Artificial Intelligence on Economy and Society

5.1. The Promoting Effect of Artificial Intelligence on Economy from the Perspective of Factor Input

Technological innovation is the main decisive factor for economic growth, and skills-intensive technological progress improves factor productivity and relatively increases the supply of highly skilled workers [5]. With the normalization of artificial intelligence application, economic development is dependent on social investment in artificial intelligence equipment to achieve high-speed and high-quality development. For example, trucks in the transportation industry are used as capital inputs to supplement labor force to reduce costs and improve work efficiency. However, in the past, trucks were limited by labor force because they needed

drivers to drive them. When the marginal output of capital was reduced to a certain extent, economic growth would stall. But now, relying on the development of artificial intelligence, UAV has put forward a relatively comprehensive and feasible solution, even without labor input, can achieve steady economic growth while meeting the market demand.

Before the application of artificial intelligence, people make up for the shortage of non-renewable factor labor force by improving technology. Here, technology belongs to the capital in production factors, similar to the improvement in truck manufacturing in the above example. At this time, capital and limited labor are mutually substitutive, and capital input is diminishing marginal benefit. After the application of artificial intelligence, the positive effects are mainly reflected in the following aspects: first, it can replace human beings to perform some complex and dangerous tasks. For example, when accidents happen, UAV can carry out field exploration on behalf of human beings. Secondly, artificial intelligence based on deep learning and other technologies can replace some repetitive tasks, realize intelligent production management and improve labor productivity; Third, it can promote innovation and improve existing products and services.

5.2. With the Help of Technology and Capital, the Application Scale of Big Data AI Continues to Expand

The most important carrier of artificial intelligence is machine. Most of the carriers discussed above are industrial machines, while the artificial intelligence applied in economy and society is mainly service machines. Therefore, the scale of artificial intelligence application from an economic perspective can reflect the influence of artificial intelligence, especially big data intelligence, on economy and society from another perspective.

1. Large-scale implementation of artificial intelligence applications drives the booming development of the big data intelligence market

In recent years, the application scenarios of artificial intelligence in various industries have been continuously explored. With the support of national policies, various new model technologies have also sprung up, and the quality of artificial intelligence products has been polished and refined. At present, the application of artificial intelligence has radiated from the pan-C terminal fields such as consumption and Internet to the traditional industries such as manufacturing, energy and electric power. Artificial intelligence technology is widely used by enterprises in various industries in design, procurement, production, management, marketing and other economic production activities. People's increasingly skilled use of technology accelerates the implementation of artificial intelligence in all aspects. In order to gain advantages in industry status and market share, enterprises are exploring more "intelligent" channels for main business.

2. The market scale is growing year by year, and financial data is the first to get value release

According to iResearch, the market size of big data intelligence covering big data analysis and prediction (machine learning/deep learning model), domain knowledge graph and NLP application is about 55.3 billion yuan in 2021, and is expected to reach 145.6 billion yuan in 2026, 2021-2026 CAGR=21.3%.

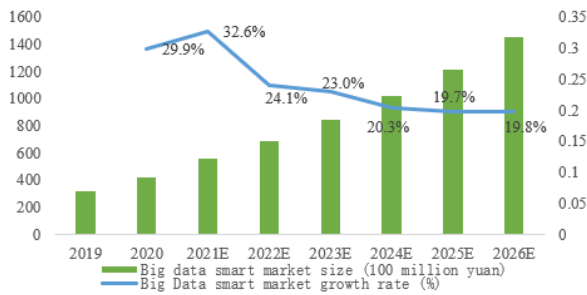


Figure 1. Size of big data smart market in 2019-2026
Sources: 2021 Artificial Intelligence Industry Research Report (IV), iResearch

With the improvement of the market big data foundation and the awakening of data demand, the size of the big data intelligent market will continue to rise. From the perspective of the segmentation structure, the data value of the financial field is the first to be released, accounting for 32% of the market size.

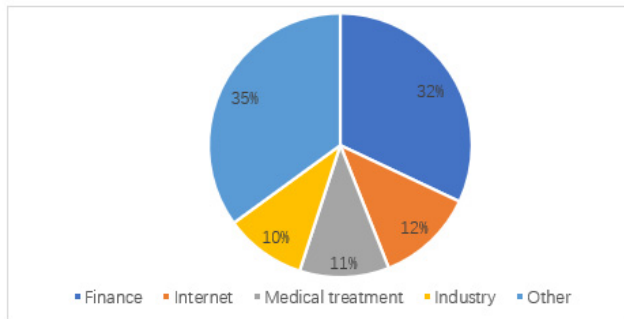


Figure 2. Big Data smart market size segmentation structure in 2021
Sources: 2021 Artificial Intelligence Industry Research Report (IV), iResearch

3. The scale of financing increased steadily and the number of events reached a record high

In terms of the number of investments, from 2011 to 2021, the capital market is paying increasing attention to the big data intelligent market, and the financing events are increasing year by year. In 2021, the number of investment and financing in the big data intelligent market has reached 99 in a single year, and 447 in total from 2011 to 2021.

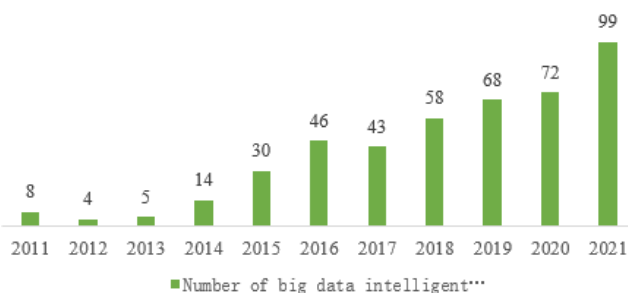


Figure 3. Number of big data smart market investment and financing events from 2011 to 2021
Data source: iResearch Institute

5.3. An Example of the Application of Artificial Intelligence in the Financial Industry

Driven by policy guidance and endogenous demand, the financial industry, one of the most informationized and information technology-intensive industries in China, has also experienced the development process from infrastructure

construction and platform construction to AI application construction. With the deepening of information technology innovation, financial institutions have higher requirements for the security, stability, flexibility, functionality and scalability of artificial intelligence systems, which encourages banks to continuously increase investment in artificial intelligence and provide solutions by setting up separate technology subsidiaries. In general, banks are financial institutions that are the earliest and most invested in the layout of artificial intelligence technology.



Figure 4. Technological development of China's financial industry
Sources: 2020 China AI+ Financial Industry Development Research Report, iResearch

In recent years, artificial intelligence has been deeply integrated with financial business, accompanied by AI application businesses such as intelligent risk control, intelligent marketing and intelligent collection, and transformed from the foreground to the middle and background.

6. Conclusion

In addition to what has been mentioned above, the possibility of artificial intelligence acquiring subject "consciousness" poses a threat to the sustainability and subjectivity of human species. Another concern is that large-scale application of artificial intelligence in all walks of life will lead to massive unemployment and social inequality. A large number of workers engaged in relatively simple and repetitive jobs in our country will face job opportunities disappear and be forced to lay off. Still a large number of workers face career transition after artificial intelligence is involved. At the same time, AI technology will tend to be controlled by a small number of people, most people can only do odd jobs and weaken their negotiating power in wealth distribution, resulting in worsening social inequality, economic growth and social order are facing challenges.

From the historical development of modern artificial intelligence, people are full of expectations for the progress of artificial intelligence from the perspective of improving social production efficiency. Economic and social examples also fully prove that economic development has achieved rapid growth with the help of artificial intelligence, and there is the possibility of singularity in economic development. But given the possibility of artificial intelligence gaining consciousness independent of human thought, there is renewed concern that the "singularity" is approaching. Relatively speaking, people's concerns about unemployment and growing social inequality seem to be easing, which may be related to the same number of people who believe AI will create more jobs and increase per capita income while allowing people more leisure time.

This paper argues that the premise for the machine to obtain subject "consciousness" and the coming of "singularity" has not been proved by many scientific disciplines, and it is far from reach at present. And this debate brings new thinking to human beings: What is the core of human to maintain subject status? Is it possible that the "consciousness" of AI is a new kind of "consciousness" independent of humans? And how can we constantly "upgrade" ourselves so we don't become

obsolete in the new age of artificial intelligence? In terms of economic and social facts, AI is likely to continue to promote high-quality economic development. For the accompanying challenges to social order, the government needs to adopt reasonable policies, control the scale of artificial intelligence through financial guidance, fiscal expenditure and other means to maximize social welfare, and at the same time increase redistribution efforts to improve the social security system [7].

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