

Commercial application and prospects of Artificial Intelligence

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Abstract: Artificial Intelligence (AI) is not only a topic in the technical field, but a comprehensive topic closely related to various industrial developments, social progress, people's lives and even human destiny. This paper will release the overview of the research progress in artificial intelligence, the impact of artificial intelligence on industrial development and employment, response to the development of AI and prospects for large-scale commercial application of AI.

1. Introduction

Artificial Intelligence (AI) is not only a topic in the technical field, but a comprehensive topic closely related to various industrial developments, social progress, people's lives and even human destiny. Research on the technical research, industrial application of AI and its comprehensive, profound and even revolutionary impact on human society is in the ascendant. This topic will focus on the impact of large-scale commercial application of AI on human development, and the countermeasures for future human resource development in China.

2. OVERVIEW OF THE RESEARCH PROGRESS IN AI

According to the White Paper on AI Innovation (2017) published by the Chinese Society of AI, AI is a collective term for using computer simulation of human intelligence behavior science. It covers training computers to enable independent learning, judgment, and decision making even the scope of human behavior^[1]. AI can be divided into special AI (roughly corresponding to weak AI) and general AI (roughly corresponding to strong AI). Special AI, that is, AI applied in a specific field, such as AlphaGo which can learn, and make full use of the acquired skills. AI solves new problems and meets or exceeds human intelligence. Universal AI is an AI image that subverts human society in many science fiction works. However, in the theoretical field, there is no real breakthrough in general AI algorithms. In the foreseeable future, general AI is neither the mainstream of AI discussion nor the mainstream. Less than the technical path that becomes a reality. Special AI is the protagonist in the new wave of AI^[2].

The concept of AI was formed in the 1950s (usually considered to be the beginning of the Dartmouth Conference), and its development stage experienced three major waves^[3]. The first was the era of machine translation focusing on logical reasoning in the 1950s and 1960s; the second was the era of expert systems based on the accumulation of knowledge in the 1970s and 1980s; this time it was the focus on data and autonomy since 2006. The cognitive intelligence era of learning. Under the conditions of mature data, algorithms and computing power, the AI in this wave began to solve the problem and create economic effects.

Marvin Minsky of the Massachusetts Institute of Technology is regarded by many as the father of AI. In his book *Society of Mind*, it emphasizes that "the brain is nothing but a machine for meat." Minsky firmly believes that "AI is something that has been able to maximize human capabilities in history. Human beings are not the end of evolution^[4]. Singular University President and famous futurist Ray Kurzweil predicted that in 2029, a new generation of intelligent machines will pass the

Turing test, and non-biological people will appear in this year, and humans will become hybrid robots. , entering a new phase of evolution. Kevin Kelly, the famous American "Internet Prophet" and author of the best-selling book "Out of Control" and "Inevitable", believes that AI will be the most important technology in the next 20 years. Yuwal Hulari, author of A Brief History of the Future, believes that "as algorithms push humans out of the job market, wealth and power may be concentrated in the hands of very few elites with powerful algorithms, creating unprecedented social and political inequalities," Many people will become "useless classes". In the book "AI", Li Kaifu believes that we do not need to worry and fear the arrival of the era of AI. What we should do is to recognize the relationship between AI and human beings as soon as possible, understand the laws of change, and better embrace the new era.

Ma Yun believes that the era of intelligence is not something that the machine can do, but the machine that people can't do. Machines should not be human replacements and competitors, but should be partners. Only when we work together, machines and people are the smart age we want.

Zhu Yongxin, vice president of the China Education Society, believes that traditional school education can't really teach each child to teach and class, and that AI brings such opportunities. They find Difficulties and key points to help students adjust the learning process in a timely manner and tailor the learning plan By tracking and recording all the learning processes of students. The future is the era of "human and machine education." Teachers as a profession will not be replaced, does not mean that all teachers will not be eliminated. Repetitive and mechanical work can be handed over to AI. Teachers need to continuously learn, pay attention to the latest technological progress, and learn how to use AI technology to analyze cases and problems in the teaching process. Li Xiaoming, a professor at the School of Information Science and Technology at Peking University, believes that online education breaks the limitations of time and space and allows the best quality education to be at your fingertips. However, it is not possible to give students precise and personalized learning guidance. After combining AI with online education, a course with tens of thousands of listeners has obtained tens of thousands of sample data through technical analysis. By comparing personal learning behavior data with others, you can customize your personal learning path. Revise online course content.

Luo Weidong, vice president of Zhejiang University, believes that the disciplines of AI are still being explored in colleges and universities. At present, it is necessary to further improve the curriculum system and explore a compound talent training model. At the same time, the ethical and moral controversy that may be caused by AI is also a link that cannot be ignored in the cultivation of talents. Liu Qingfeng, president of Keda News, believes that AI will solve the two problems faced by the "one-year multi-test" after the college entrance examination reform. First, it is possible to ensure that the difficulty of each test, and avoid the phenomenon that the exam is simple in the first half of the year and difficult in the second half of the exam using AI technology to judge. The second is the objective impartiality of subjective questions. Because the real teacher corrects the subjective problem, there is a situation where the teacher who takes the kindness takes a high score is not objective, and the use of AI technology can be treated equally. At present, the AI technology of Keda News has revised the subjective questions such as English composition and Chinese composition, and the objective and fairness has surpassed that of the real teacher.

In Summary, AI technology research has made major breakthroughs and has begun to be widely used. Specialized AI and its applications will be the main direction of AI research. The debate about the impact of AI on human development will continue.

3. THE IMPACT OF AI ON INDUSTRIAL DEVELOPMENT AND EMPLOYMENT

The impact of AI on the development of the industry and the impact of employment on the livelihood sector is the most interesting. In the face of the rapid development of AI research and commercial applications, Different scholars have diverse views in the AI research. The pessimist considered that since AI can do better than humans in many specific work (such as Go) and learn faster than humans, what is the meaning of living^[5]? Since AI can replace humans in many jobs, how should human values be reflected? Famous scientist Hawking and business leader Bill Gates

are representatives of pessimists. The optimist considered that super AI is still in the foreseeable future. AI and human collaboration are the main theme of the future. The challenge of AI to the meaning of life mainly comes from the psychological feelings of human beings. If we can accept human cooperation (Objects, machinery, vehicles, and people to work together) in the farming area, why can't we accept AI as a good helper? Li Kaifu etc. are considered representatives of the optimist.

Wu Jun, author of "Intelligent Times", observed that in the past 300 years, the major technological revolutions that human beings have experienced have followed such a pattern: existing industries + new technologies = new industries. Some new industries have emerged in new forms. For example, the advertising industry gradually changed from past print advertisements and TV advertisements to Internet advertisements. Some were brand new industries, such as telegraphs and telephones, which gave birth to the telecommunications industry. In the next intelligent revolution, it will still be the transformation of existing industries and the birth of new industries. However, no matter which one, they all have the same characteristics, that is, intelligent and refined, so we may wish to refer to them as "smart industries." In these industries, intelligent computers can help us do quite a lot of work, even most of the work. In 2011, Germany proposed industry 4. The concept of AI is to improve the level of manufacturing through digitization and intelligence. Correspondingly, China has also proposed the concept of China Manufacturing 2025. Its core is to help workers and even replace workers through intelligent machines and big data analysis to achieve comprehensive intelligence in manufacturing. In the United States, Tesla Motors has tried to use all robots to assemble cars, which not only drastically reduces the number of workers employed in the factory, but also makes the performance and quality of the factory cars more stable. Once upon a time, the number of industrial workers was seen as an important indicator of manufacturing competitiveness, and workers in a large number of low-wage production lines created a global manufacturing boom. Known as the "world factory", China has entered the ranks of the world's manufacturing powers after this reform and opening up. Wu Jun still believes that the revolution brought about by machine intelligence will have an all-round impact on society. The so-called intelligence-intensive work we rely on is also disappearing. Even if new industries emerge, they will need fewer jobs than in the old industry due to the influence of machine intelligence. When the intelligent revolution arrives in an all-round way, it is impossible to turn the agricultural population into an urban population as in the past, and it is as simple as turning the primary and secondary industries into tertiary industries.

Yuval Hulari, author of *A Brief History of the Future*, further believes that since the outbreak of the industrial revolution, humans have feared that mechanization could lead to massive unemployment. However, this has not happened in the past, because with the elimination of the old profession, there will be new occupations, and there are always things that humans do better than machines. However, this is not a law, and no one can guarantee that this will continue in the future. Humans have two basic abilities: physical ability and cognitive ability. When the competition between machines and humans is limited to physical abilities, humans have countless cognitive tasks that can be done better. So, as machines replace pure physical work, humans turn to work that requires at least some cognitive skills. However, what happens when the algorithm waits for humans to surpass humans in their ability to remember, analyze, and recognize patterns?

In 2004, Professor Frank Levy, the Massachusetts Institute of Technology and Professor Richard Meran of Harvard University, published a comprehensive study on the job market, listing the careers most likely to move toward automation. An example of a career that was impossible to automate in the foreseeable future was the truck driver. It was hard to imagine a computer that can drive a car safely on a busy road. But only after more than a decade, Google and Tesla not only thought of this, but also stepped up research and development of driverless technology, and have made breakthrough progress.

It is expected that the rapid development and popularization of AI technology may have a subversive and irreversible impact on the future employment market. Relevant academic institutions and market risk analysis agencies have published a series of forecast reports through analysis. In

2013, Oxford University scholars Carl, Benedict Frey and Michael Osborne examined the possibility of computerization of 702 occupations, sorted according to the risk of being replaced, and concluded that the United States would have 47 % of the work faces the risk of being replaced by computers. Among the five types of work, such as telephone promoters, accountants, sports referees, legal secretaries, and cashiers, were identified as the jobs most likely to be replaced by computers, while doctors, preschool teachers, lawyers, artists, and pastors were relatively safe. Subsequent research indicates that 35% of occupations in the UK may be replaced, compared with 49% in Japan. In 2015, Merrill Lynch predicted that by 2025, global AI “influence of creative damage per year” could reach 14 trillion to 33 trillion US dollars, including employment costs caused by AI to automate knowledge work. The \$9 trillion reduction, the \$8 trillion in manufacturing and medical care expenses, and the \$2 trillion increase in efficiency after deploying driverless cars and drones. The McKinsey Global Institute predicts that AI is promoting social transformation, which is 10 times faster than the industrial revolution, 300 times larger, and almost 3,000 times more affected.

According to the “Wuzhen Index: Global AI Development Report (2016)” released in October 2016, with the comprehensive technology maturity and practical application scenarios, the main applications of AI in the short term will focus on personal assistants, security, autonomous driving., Medical health, e-commerce retail, finance, education and so on^[7].

In the book "AI" co-authored by Tencent Research Institute and China Information and Communication Research Institute, with the development of technology, although AI can assist or even replace human labor in more and more industries, in individual areas, AI will be difficult to replace due to its technical characteristics, including innovative occupations such as artists and inventors, as well as psychology and other occupations. This is because the realization of AI usually forms an experience by analyzing a large amount of data and summarizing the general laws of the development of things, so that when encountering new things, it judges according to the previous experience. Artists and inventors usually use new methods to explore new discoveries or discoveries, so the process does not necessarily conform to the usual logic or experience, or even because of accidental, inventing or creating new things. The high accuracy of AI obliterates the above possibilities^[2].

In summary, the development of AI will inevitably lead to new industries, and its transformation and impact on existing industries will be profound. The replacement and impact of AI on employment is inevitable, and the substitution in some areas has been or is about to begin. The impact and response are likely to be different from the impacts and countermeasures of the previous technological revolution and industrial revolution.

4. RESPONSE TO THE DEVELOPMENT OF AI AT THE NATIONAL LEVEL

The development of AI and the response to its impact in major countries around the world are still very positive. The US White House has released three government reports on AI, which is the first country in the world to raise the development of AI to the national strategic level. The strategic planning of AI is regarded as the new Apollo moon landing plan of the United States. Being able to have the same dominance in the field of AI as it did in the Internet age, The UK accelerated the application of AI technology through the 2020 Development Strategy. The European Union launched the world's largest civil robot research and development program “SPARC” in 2014. The Japanese government formulated the “Japan Robot Strategy: Vision, Strategy, Action Plan” in 2015. Promote the development of AI robots. In 2017, China released the New Generation AI Development Plan with a view to building AI first-mover advantage and accelerating the construction of innovative countries and world science and technology powers^[8].

It can be foreseen that the large-scale commercial application of AI technology will inevitably lead to a large number of unemployed labor in the short-term, reasonable arrangement, diversion or re-use of these labors through training, which will pose a major test to the government;

European and American powers have released AI development planning for the field in recent

years. Such as "2016 American Robot Development Roadmap", "Promoting Innovative Neurotechnology Brain Research Program", the European Sparks Program, the Human Brain Program, and the British "Robot Technology and AI" report. On the one hand, the above documents predict the large-scale application of smart technology, which will fundamentally change the employment market pattern of each country, but at the same time affirm that emerging industries will bring new job opportunities to replace the industries that may disappear. On the other hand, from the perspective of future workers, the document predicts that people may change jobs more frequently, which requires them to master the job skills that can be converted at any time, and emphasizes the importance of talent and talent training mechanisms in the future. In addition, it is not difficult to see from the planning that countries have realized that with the advent of the AI era, whoever has the most advanced technology and who has the right to formulate international standards, who can master the international market Great initiative and flexibility in the future international job market.

Wu Jun, author of "Intelligent Times", believes that every technological revolution requires at least one generation of time to eliminate the negative effects, including the disappearance of industry, the decline in the working population and the search for a way out for the released labor. So, what can be done to minimize this cycle?

It is foreseeable that after entering the era of AI, the gap between the employment markets between countries will be further narrowed, and technical cooperation and data flow between countries will become more frequent. Therefore, establish uniform technologies and testing standards, especially security standards, including data. The collection, processing and cross-border movement rules, as well as the minimum safety standards, will help increase the trust of countries in the international AI job market and facilitate exchanges and cooperation among countries.

Faced with the challenges brought by the era of AI, on the one hand, the government should separately formulate short-term and long-term industrial strategic plans and enact national digital strategies as soon as possible to help workers better cope with increasingly automated and autonomous markets while preventing the phenomenon of rejection of digitization occurs. On the other hand, the government should do a good job in propaganda, education and resource allocation according to the plan, strengthen investment in the field of vocational training, give workers the opportunity to update their skills, and reduce the large-scale application of automation technology and automated machines to the employment of workers.

5. PROSPECTS FOR LARGE-SCALE COMMERCIAL APPLICATION OF AI

With the release of a new generation of AI development plans by the Chinese government, the development of China's AI industry has also been pushed to new heights. According to the report released by the China AI Society and Roland Berger, the development of AI has broken through the prediction of the application effect of the commercial field, and is enthusiastically sought after by venture capital funds. The application scenarios of AI technology are also in various ways. The industry is becoming clearer and begins to bring real business value to the cost reduction.

According to the estimates of the above institutions, by 2030, AI will generate 10 trillion RMB of industry-driven benefits in China: AI is expected to bring about a cost-reduction benefit of about 600 billion in the financial industry; AI breakthroughs in autonomous driving technologies will bring about a value gain of about 500 billion in the automotive industry; AI is expected to bring about a cost reduction of about 400 billion in the medical industry; AI technology is expected to bring about a cost-reduction benefit of 420 billion in the retail industry.

Throughout the development of the global AI industry, it can be found that the world's leading innovation hubs are scattered in various countries, such as New York and Silicon Valley in the United States, London, Israel, and Beijing, Shanghai and Shenzhen in China. AI technology itself has the characteristics of high circulation and easy transmission. Under the global environment of open information flow, the development of AI is no longer restricted to countries or regions. With the help of a good talent base, a huge application market, and strong venture capital fund support, China's AI enterprises have a good momentum of development and are leading the world in

advantages. The number of AI companies, the number of patent applications and the scale of financing in China are second only to the United States. In China, AI enterprises in the fields of computer vision, service robots and natural language processing account for more than half of the number of AI enterprises. Beijing, Shanghai and Shenzhen are the highlands of domestic AI innovation, and the number of related enterprises accounts for nearly 80% of the total number of domestic enterprises.

In terms of commercial applications, in the short term, dedicated AI will be widely used in data-rich industries and business front-ends (such as marketing, services, etc.); in the long run, AI technology will be able to achieve marginal cost. Personalize services to more consumers and businesses without increasing, from specific application scenarios in the industry to more general scenarios.

Specific to the relevant industry sectors, the development and application of AI in the financial, retail, medical and automotive industries is the most solid. The financial industry has a good data accumulation, and it has a good shaping effect in the use of automated workflows and related technologies, and is in a medium-dominant position in the organization's innovation culture and flexibility. The medical industry has many years of medical data accumulation and streamlined data use processes, so it has a strong advantage in terms of data and technology.

The automotive industry has begun to use AI technology to lay out autopilot and assisted driving technologies, so it has a good advantage based on organizational and AI applications. The retail industry has a certain foundation in organizational structure, data accumulation, and AI applications, and is in a relatively balanced state of development. At the same time, the manufacturing, education, and communications industries are also worthy of attention. Although the manufacturing industry and the communication industry have relatively weak foundations in the organization, they have provided a good technical foundation for the intervention of AI technology due to the large amount of high-quality data accumulation and automated workflow. Although the data accumulation in the education industry is still in the process of development, it will combine or apply AI technology.

6. Conclusions

Artificial intelligence has a promising business prospect, and its commercial applications in the financial, retail, medical and automotive industries will be at the forefront; China is at the advanced level in the world in the field of artificial intelligence innovation research and commercial applications. The development level of artificial intelligence industry in Beijing, Shanghai and Shenzhen is in a leading position. Countries such as China are focusing on the development of human intelligence, programmers, mathematics and computer linguistics professionals, experts in data processing and deep learning, to enable practitioners in the economic, business, education, health, justice and other fields to understand and use the artificial intelligence technology associated with it to build a new process for production and management.

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