

Next-Generation Artificial Intelligence: Social Impacts and Risk Governance

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Abstract: With the breakthrough development of next-generation artificial intelligence (AI) technologies such as deep learning, multimodal technology and large language models, the field of AI has shown an unprecedented development momentum. AI is rapidly changing the economy, society and daily life, and it provides an important driving force for industrial upgrading, social governance and greater convenience of life. However, accompanying this development process are multidimensional risks concerning information security, social equity, employment structure, resource consumption, geopolitical conflict and the digital divide. In response to the risks derived from next-generation AI technologies, it is necessary to continuously advance the building of algorithmic transparency, improve the legal and ethical framework, strengthen social security capacity, promote green technological innovation and deepen international cooperation, so as to realize the sustainable development of next-generation AI on the basis of ensuring its safe and equitable development and to let the world share the dividends of AI development.

Keywords: next-generation artificial intelligence; social impact; risk governance; international cooperation

1 Introduction

During the Second World War, mathematicians represented by Alan Turing invented the precursors of modern computers, which greatly raised the computing speed of humankind. These experiences prompted Turing to raise a landmark question in his 1950 work *Computing Machinery and Intelligence*: “Can machines think?” In 1956, another pioneer of the computer industry, John McCarthy, formally proposed the concept of “artificial intelligence”, meaning that machines might simulate the intellectual characteristics of human beings.[1] Since then, talents from various disciplines around the world have devoted themselves to research in this field. Over the course of several decades, research on AI formed three major schools, namely “structural simulation”, “functional simulation” and “behavioral simulation”, which represent different research philosophies and each possess unique advantages in different scenarios. Fundamentally, however, under the technological conditions of that time, AI research as a whole lacked the foundation of the “three computations” (computing power, algorithms and data), and thus remained for a long period in an awkward state in which progress was difficult to achieve.[2]

Since the beginning of the new century, breakthroughs in semiconductors, high-speed communications and digital storage technologies have accelerated the informatization of human society. The exponential growth of computing power, the continuous optimization of algorithms and the explosive expansion of data scale have created unprecedented development opportunities for AI research. Next-generation AI technologies have risen rapidly and become a core field of global technological innovation. However, technological development is often a “double-edged sword”: while enhancing human well-being, it may also generate unpredictable potential risks. This requires us to conduct in-depth research on the mechanisms through which AI affects social systems and to build a corresponding risk prevention and control system.

2 Development Status of Next-Generation Artificial Intelligence

In July 2017, the Next Generation Artificial Intelligence Development Plan issued by the State Council explicitly pointed out that “the overall advancement of next-generation AI-related disciplinary development, theoretical

modeling, technological innovation and the upgrading of software and hardware is triggering chain breakthroughs and driving all fields of the economy and society to leap from digitalization and networking to intelligence at an accelerated pace”. In the years that followed, leading AI research institutions and enterprises at home and abroad continued to make efforts, actively seizing the trend of the digital era of human society and pushing AI from small-scale, laboratory testing to large-scale, commercial application. At present, next-generation AI is advancing in both the technological and commercial fields and has achieved major progress.

First, major countries in the world, represented by China, attach greater importance to the development of next-generation AI. The Resolution of the Central Committee of the Communist Party of China on Further Deepening Reform Comprehensively to Advance Chinese Modernization, adopted at the Third Plenary Session of the 20th Central Committee of the Communist Party of China, mentions “artificial intelligence” in several places: improving the policies for the development of strategic industries such as artificial intelligence and their governance system; improving the development and management mechanisms of generative artificial intelligence; establishing a security supervision system for artificial intelligence; and strengthening the building of multilateral cooperation platforms including artificial intelligence within the framework of the Belt and Road Science, Technology and Innovation Cooperation Action Plan. At the same time, since the beginning of 2024, major Western countries such as the United States, the United Kingdom, Germany and France have also frequently introduced policies in the field of next-generation AI, seeking a dominant position.[3]

Second, the scientific and technological community continues to advance research and development on the core technologies of next-generation AI, among which deep learning, multimodal technology and large language models are particularly noteworthy. Deep learning is an important development direction of next-generation AI, whose core lies in training computers to extract features from large amounts of data and to make predictions or classifications by simulating the neural network structure of the human brain. With the improvement of computing power and the increase of data volume, deep learning has already achieved remarkable progress in fields such as speech recognition, image processing and even logical induction. Multimodal technology, by contrast, mainly involves a more composite and integrated form of next-generation AI. Compared with traditional AI, multimodal technology is able to process and integrate multiple types of information sources such as text, images, audio and video to form a more comprehensive understanding and decision-making; it helps realize the multidimensional integration of the information input and output of AI systems and improves system performance in complex environments. Large language models, by processing large amounts of text data, learn the structure and usage rules of human language and can generate natural language that conforms to grammar and semantics. These models can not only understand and generate text but also, to a certain extent, carry out reasoning, solve problems and generate creative content.

Third, the business community’s interest in investing in next-generation AI remains undiminished. The Development Report on the Application of Generative Artificial Intelligence (2024), released by the China Internet Network Information Center in November 2024, shows that the number of users of generative AI products in China has reached 230 million, and that the scale of the AI core industry has approached 600 billion yuan. According to relevant statistics, since 2018 the annual scale of venture capital in global AI start-ups has remained above 50 billion US dollars, reaching as high as 110 billion US dollars in individual years. In particular, the four major US digital platform enterprises with enormous wealth in hand (Meta, Google, Microsoft and Amazon) continued their high-intensity investment in 2024, with investment in AI infrastructure reaching 52.9 billion US dollars in the second quarter. From the beginning of 2024 to September, the scale of global venture capital in AI start-ups reached 64.1 billion US dollars; proportionally, nearly one third of all venture capital funds flowed into the AI industry.[4]

3 Positive Economic and Social Impacts of Next-Generation Artificial Intelligence

Next-generation AI has made breakthrough progress in technological innovation and industrial application and

is accelerating its penetration into all areas of society, exerting a profound impact on dimensions such as politics, the economy and culture. In terms of positive impacts, next-generation AI holds important potential for promoting economic growth and enhancing social welfare.

First, creating entirely new industries and improving production efficiency. Although generative AI chatbots such as ChatGPT have swept the world, next-generation AI is not merely a single text or video generation technology but a complete set of technological innovation and empowerment systems with foundational significance. Next-generation AI is deeply integrating with various industrial fields, forming an intelligent economic form characterized by data-driven operation, human-machine collaboration, cross-boundary integration and co-creation and sharing. On the one hand, next-generation AI technology has developed into an emerging industry, with technological transformation, integration and innovation constantly emerging, thereby giving rise to numerous new business forms. These business forms usually have high added value and are located at the high end of the global industrial chain and value chain, such as AI software and hardware, intelligent industrial robots and intelligent (driverless) transportation vehicles. At present, next-generation AI powers such as China, the United States, the United Kingdom, France and Germany have all seen the emergence of a large number of AI-related industrial giants, which have provided strong impetus for the economic growth and high-quality development of these countries. On the other hand, as the “leading goose” of science and technology, next-generation AI has an even more obvious spillover and driving effect on other industries. From December 11 to 12, 2024, the Central Economic Work Conference identified nine key tasks to be accomplished in 2025, one of which is to lead the development of new quality productive forces with scientific and technological innovation, build a modern industrial system and carry out the “AI Plus” initiative. “AI Plus” means organically combining next-generation AI technology with all walks of life and various application scenarios in order to create more value.[5] For example, with the support of next-generation AI, the level of automation and intelligence of production equipment and processes in the manufacturing industry has been greatly raised, making year-round uninterrupted operation possible and significantly reducing the error rate of traditional manual supervision of production, thereby greatly increasing production capacity. In addition, in industries such as financial transactions, transportation and logistics distribution, next-generation AI possesses huge databases and enormous computing power and can provide these industries with optimal operations research solutions beyond the reach of the human brain, thereby saving a great deal of time and cost, improving production efficiency and reducing people’s workload.

Second, enhancing social governance capacity and improving social welfare. Research has pointed out that different AI policies of various countries will have a significant impact on the structure and level of their social welfare.[6] At present, next-generation AI is comprehensively integrating big data, high computing power and strong algorithms, and therefore has strong potential for solving some traditional difficulties in social governance. In the healthcare industry, some German AI enterprises have already applied machine deep learning to medical imaging detection, significantly reducing costs while greatly improving diagnostic efficiency and accuracy. In the field of education, AI is empowering various online learning platforms, which can provide high-quality educational resources based on an entire large database and can completely break down spatial barriers, significantly alleviating the problem of unbalanced regional development of education. In multiple fields such as weather forecasting, climate change monitoring and environmental protection, next-generation AI technology has demonstrated its outstanding “three computations” capability, significantly improving the observation and prediction levels of these industries and reaching unprecedented heights.

Third, fully integrating into daily life and improving food, clothing, housing and transportation. With its powerful computing capability and self-learning ability, next-generation AI has greatly enhanced the convenience of human daily life. From intelligent voice assistants to recommendation algorithms, AI enables people to obtain the information they need in daily life more accurately and quickly. Whether it is everyday shopping, restaurant reservations, traffic navigation or health care, various intelligent terminal devices and software empowered by AI can better understand

consumers' personalized needs and make rapid matches. Especially in China, numerous emerging AI ecosystem enterprises are rising rapidly, and the innovative products they launch are widely penetrating into multiple fields such as automobiles, home appliances, entertainment, payments and health, greatly enhancing the convenience of users' daily lives and realizing the efficient experiences of "one-click interconnection" and "one-touch access".

4 Governance Risks of Next-Generation Artificial Intelligence

However, next-generation AI also clearly carries very high risks; its "double-edged sword" effect has already become prominent and is causing major challenges to the social development and national security of various countries.

First, risks to information security and privacy protection. The rapid development of next-generation AI, especially generative AI and multimodal large models, has greatly increased the ability of criminals to steal other people's private data and fabricate false information, while the cost has dropped significantly. Ordinary people in various countries have long developed a relatively strong awareness of prevention against traditional paper-based and text-based false information, but AI technology has enabled false information to be "completely reborn". Vivid audio, images and videos are extremely deceptive to the general public. Such deepfake false information not only harms the people's immediate interests, such as personal privacy and property security, but is even more likely to be used to manipulate public opinion, disrupt social order and even interfere in internal affairs and subvert state power.

Second, risks of algorithmic discrimination and social equity. Recently, some scholars have particularly pointed out that the outstanding progress of next-generation AI has caused human society's attitude toward intelligent systems and their services to develop from a former lack of trust to today's excessive trust.[7] However, AI and the algorithms behind it can never achieve true objectivity and fairness; the more powerful and the more ubiquitous the algorithms become, the more likely they are to distort this excessive trust into "information cocoons", which will then gradually create solid cognitive barriers among different groups of people and ultimately exacerbate problems of social unfairness and injustice.

Third, risks of labor replacement and social shock. The AI Index Report released by Stanford University in 2024 points out that next-generation AI has already surpassed humans in task performance in image classification, visual reasoning, language understanding and other tasks, and is therefore especially good at completing repetitive and procedural tasks related to standardized text and numbers. Against this background, the employment patterns of human society will inevitably be profoundly affected; for example, occupations such as data entry clerks, retail cashiers and telephone customer service operators may face the risk of being replaced. In addition, research by the International Monetary Fund finds that in advanced economies about 60% of jobs may be affected by AI, while in emerging markets and low-income countries the share of jobs affected by AI is estimated at 40% and 26% respectively; besides this, AI may also affect income and wealth inequality within countries. The above employment and income problems are ultimately likely to trigger social protests, creating additional challenges for national governance.

Fourth, risks of natural resource consumption and environmental sustainability. At present, behind the prosperity of next-generation AI lies the further excessive consumption of natural resources by various countries. For example, compared with traditional data centers, AI data centers consume more electricity and water. In 2024, data centers in the United States and Canada ordered 33,675 megawatts of electricity from power generation companies, an increase of about 8.7 times over electricity consumption in 2015.[8] Nature magazine pointed out that, amid an increasingly serious freshwater shortage crisis, persistent droughts and rapidly aging public water supply infrastructure, there is an urgent need to thoroughly investigate and address the water consumption problem of AI; as demand for next-generation AI surges, related water consumption will increase to 4.2 billion to 6.6 billion cubic meters before 2027, about half of the UK's total annual water consumption.[9]

Fifth, risks of AI militarization and global development. At present, some Western powers are forcibly advancing

the weaponization of AI, combining next-generation AI with traditional weaponry and equipment in the hope of producing fully autonomous weapons (the so-called “intelligent killing machines”). Such practices not only violate traditional human morality but will also completely subvert national defense and the form of warfare. More importantly, certain hegemonic countries, in order to preserve their hegemony, clearly seek to monopolize the field of AI and hope to create a generational gap in the development capacity of other countries. On the one hand, such practices force other major countries to make reciprocal responses, triggering an AI arms race; on the other hand, they significantly widen the global digital development divide, and the huge global development gap in which “the winner takes all and the weak become weaker” will become more pronounced, thereby bringing more deep-seated destabilizing factors to the world.

Overall, next-generation AI does indeed offer many benefits such as raising the level of economic and social development, but its risk points are numerous and significant, posing challenges to both the social development and the national security of countries. It is therefore urgent to grasp the core issues of risk governance and to take practical and effective action.

5 Key Pathways for Risk Governance of Next-Generation Artificial Intelligence

In 2018, when presiding over the ninth collective study session of the Political Bureau of the 19th Central Committee of the Communist Party of China, General Secretary Xi Jinping emphasized: “It is necessary to strengthen the assessment and prevention of potential risks in the development of artificial intelligence, safeguard the interests of the people and national security, and ensure that artificial intelligence is safe, reliable and controllable.” Faced with the greater challenges brought by the leap forward of next-generation AI in recent years, China needs to formulate more scientific and effective governance pathways so as to avoid potential threats while promoting further technological development. The risk governance of AI must both conform to China’s own national conditions and integrate technological innovation with ethical norms, and it must further promote global collaboration and practical solutions. The key governance pathways should include the following aspects:

First, advancing research and development on algorithmic transparency and strengthening risk monitoring mechanisms. One of the core capabilities of next-generation AI lies in powerful algorithms, but the current problem of algorithmic black boxes has yet to be resolved, which makes it a key driver of the complexity and opacity of AI risks. In view of this, first, research on algorithmic transparency must be accelerated. Aiming at the long-standing “pain points” of black-box machine learning and algorithms, great efforts must be made to promote the development of “explainable artificial intelligence” technology and to push the relevant achievements into practical application as soon as possible. In key areas where next-generation AI is applied, such as scenarios involving public security, personal privacy, medical health, media and public opinion, corporate internal control, and finance and communications, AI must be required to be explainable, traceable and controllable. Second, with regard to deepfake technologies such as AI face swapping, voice changing and audio and video synthesis, monitoring and early warning mechanisms must be established from the root of the program code, and the real-name registration of users of sensitive AI tools should be implemented as early as possible. AI should be used to establish a system for identifying and monitoring frontier technologies, and dynamic monitoring and normalized crackdowns should be carried out against individuals or institutions that pose a serious risk of AI abuse, especially those suspected of disrupting social order and infringing on public security.

Second, advancing ethical norms and continuing to improve the legal framework. The ethical and legal governance of AI is a core component of risk management. China’s relevant governance must focus on combining with its own national conditions and must be based on core socialist values, emphasizing that the application of AI technology must respect social morality and uphold fairness and justice, and ensuring that technology serves the well-being of the people. At the legal level, legislative bodies need to formulate strict privacy protection regulations, clarify the

scope of data collection, storage and use, and encourage enterprises and institutions to adopt data encryption and anonymization technologies so as to protect user privacy at the technical level. In addition, the legal liability issues arising from the use of AI also need to be clarified through the formulation of targeted regulations; for example, the attribution of responsibility for accidents such as algorithmic errors or system runaway should be clarified at the legal level as early as possible.

Third, paying attention to changes in the job market and strengthening the social security system. The widespread application of AI has brought far-reaching impacts on the employment structure and income distribution. The government needs to actively respond to changes in the job market through policies and social security mechanisms. First, vocational retraining and skills upgrading for workers should be strengthened, especially by providing free or low-cost skills training programs for workers in low- and medium-skilled positions to help them adapt to AI-driven industrial transformation, and in particular by strengthening training in digital modes of production and life so that they can better integrate into the modern digital and AI era. Second, a more caring labor rights protection mechanism should be established, and it should be made clear that the fundamental purpose of next-generation AI and indeed of all digital technologies is to enhance the welfare of society as a whole rather than to create a deformed world in which “machines control humans”; efforts should be made to rectify the enormous physical and psychological pressure imposed on frontline production personnel by the so-called “algorithmic traps” and “intelligent timing”. Third, a more flexible social security system, such as unemployment insurance and income supplement programs, should be developed to provide transitional support for workers affected by AI technology. At the same time, the government can use fiscal policy to incentivize enterprises to create more high-value-added positions, promote industrial upgrading and provide more employment opportunities for society.

Fourth, prioritizing the development of green technology and strengthening policy guidance and support. In order to cope with the high consumption of natural resources by next-generation AI, priority should be given to developing more energy-efficient and efficient related technologies. For example, at the hardware level, research and development on new-generation semiconductor materials such as silicon carbide should be accelerated so as to fundamentally and substantially reduce the consumption of water and electricity by next-generation AI computing centers, while at the software level greener computing architectures and optimized algorithms should be developed. At the same time, the government should guide enterprises to focus on energy saving and efficiency improvement and accelerate the application of green technologies through policies such as levying carbon emission taxes and rewarding high-efficiency technologies.

Fifth, promoting international cooperation and narrowing the development divide. As a major next-generation AI power and an important responsible and peace-loving major country in the international community, China urgently needs to strengthen its leadership by promoting the international community to formulate unified international legal norms on high-risk issues such as the development of “intelligent killing machines” and by clearly defining risk baselines and red lines. At the same time, China should also promote the open sharing of AI technology and advocate the building of an inclusive global technology ecosystem; for example, through open-source platforms and technology transfer, it can help developing countries improve their AI research, development and application capabilities. In addition, China should continue to strengthen digital cooperation in the Belt and Road Initiative, supporting more late-developing countries in joining the wave of AI development through AI infrastructure construction, talent training and experience sharing.

Next-generation AI is a milestone in human technological progress; its powerful computing capability, autonomous learning ability and wide range of application scenarios are changing the way society produces and lives at an unprecedented speed. However, accompanying technological development are not only efficiency gains and greater convenience, but also profound social, ethical and governance challenges. For example, algorithmic black boxes and bias may exacerbate inequality, privacy violations and technology abuse arouse public concern, and the militarization

of AI and global competition also put pressure on international security and cooperation. These problems show that technological progress itself is not a panacea; only by combining technological innovation with governance innovation can the safe, reliable and equitable application of AI be ensured. In the future, only by establishing a sound ethical framework, legal system and global cooperation mechanism while promoting the development of AI technology can its potential be maximized, sustainable momentum be injected into social development, and a win-win outcome for technology and human well-being be achieved.

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