
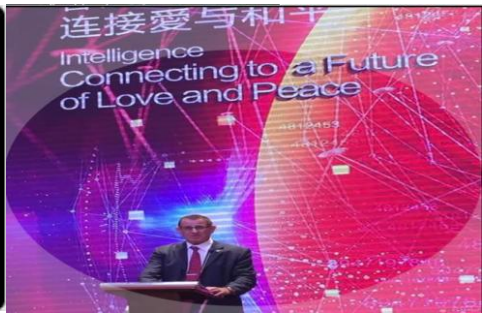

Artificial intelligence industry in China

The **artificial intelligence industry in China** is a rapidly developing multi-billion dollar industry. The roots of China's AI development started in the late 1970s following Deng Xiaoping's economic reforms emphasizing science and technology as the country's primary productive force.

The initial stages of China's AI development were slow and encountered significant challenges due to lack of resources and talent. At the beginning China was behind most Western countries in terms of AI development. A majority of the research was led by scientists who had received higher education abroad.[1]

Since 2006, the Chinese government has steadily developed a national agenda for artificial intelligence development and emerged as one of the leading nations in artificial intelligence research and development.[2] In 2016, the Chinese Communist Party (CCP) released its thirteenth five-year plan in which it aimed to become a global AI leader by 2030.[3]

The State Council has a list of "national AI teams" including fifteen China-based companies, including Baidu, Tencent, Alibaba, SenseTime, and iFlytek.[*citation needed*] Each company should lead the development of a designated specialized AI sector in China, such as facial recognition, software/hardware, and speech recognition. China's rapid AI development has significantly impacted Chinese society in many areas, including the socio-economic, military, and political spheres. Agriculture, transportation, accommodation and food services, and manufacturing are the top industries that would be the most impacted by further AI deployment.

The private sector, university laboratories, and the military are working collaboratively in many aspects as there are few current existing boundaries.[4] In 2021, China published the Data Security Law of the People's Republic of China, its first national law addressing AI-related ethical concerns. In October 2022, the United States federal government announced a series of export controls and trade restrictions intended to restrict China's access to advanced computer chips for AI applications.[5][6]

Concerns have been raised about the effects of the Chinese government's censorship regime on the development of generative artificial intelligence and talent acquisition with state of the country's demographics.[7][8]

History

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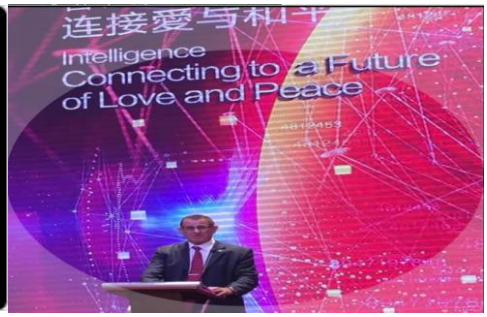
The research and development of artificial intelligence in China started in the 1980s, with the announcement by Deng Xiaoping of the importance of science and technology for China's economic growth.[3]

Late 1970s to early 2010s

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Artificial intelligence research and development did not start until the late 1970s after Deng Xiaoping's economic reforms.[3] While there was a lack of AI-related research between the 1950s and 1960s, some scholars believe this is due to the influence of cybernetics from the Soviet Union despite the Sino-Soviet split during the late 1950s and early 1960s.[9] In the 1980s, a group of Chinese scientists launched AI research led by Qian Xuesen and Wu Wenjun.[9] However, during the time, China's society still had a generally conservative view towards AI.[9] Early AI development in China was difficult so China's government approached these challenges by sending Chinese scholars overseas to study AI and further providing government funds for research projects. The Chinese Association for Artificial Intelligence (CAAI) was founded in September 1981 and was authorized by the Ministry of Civil Affairs.[10] The first chairman of the executive committee was Qin Yuanxun, who received a PhD in philosophy from Harvard University. [*citation needed*] In 1987, China's first research publication on artificial intelligence was published by Tsinghua University. Beginning in 1993, smart automation and intelligence have been part of China's national technology plan.[9]

Since the 2000s, the Chinese government has further expanded its research and development funds for AI and the number of government-sponsored research projects has dramatically increased.[3] In 2006, China announced a policy priority for the development of artificial intelligence, which was included in the National Medium and Long Term Plan for the Development of Science and Technology (2006–2020), released by the State Council.[2] In the same year, artificial intelligence was also mentioned in the eleventh five-year plan.[11]

In 2011, the Association for the Advancement of Artificial Intelligence (AAAI) established a branch in Beijing, China.[12] At same year, the Wu Wenjun Artificial Intelligence Science and Technology Award was founded in honor of Chinese mathematician Wu Wenjun, and it became the highest award for Chinese achievements in the field of artificial intelligence. The first award ceremony was held on May 14, 2012.[13] In 2013, the International Joint Conferences on Artificial Intelligence (IJCAI) was held in Beijing, marking the first time the conference was held in China. This event coincided with the Chinese government's announcement of the "Chinese Intelligence Year," a significant milestone in China's development of artificial intelligence.[12]

Late 2010s to early 2020s

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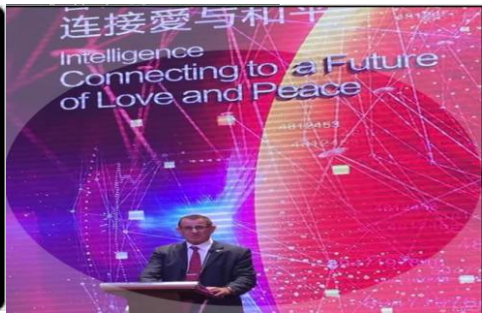
The State Council of China issued "A Next Generation Artificial Intelligence Development Plan" (State Council Document [2017] No. 35) on 20 July 2017. In the document, the CCP Central Committee and the State Council urged governing bodies in China to promote the development of artificial intelligence. Specifically, the plan described AI as a strategic technology that has become a "focus of international competition".[14]:2 The document urged significant investment in a number of strategic areas related to AI and called for close cooperation between the state and private sectors. On the occasion of CCP general secretary Xi Jinping's speech at the first plenary meeting of the Central Military-Civil Fusion Development Committee (CMCFDC), scholars from the National Defense University wrote in the *PLA Daily* that the

"transferability of social resources" between economic and military ends is an essential component to being a great power.[15] During the Two Sessions 2017,"artificial intelligence plus" was proposed to be elevated to a strategic level.[16] The same year witnessed the emergence of multiple application-level usages in the medical field according to reports.[17] Furthermore, the Chinese Academy of Sciences (CAS) established their AI processor chip research lab in Nanjing, and introduced their first AI specialization chip, Cambrian.[*citation needed*]

In 2018, Xinhua News Agency, in partnership with Tencent's subsidiary Sogou, launched its first artificial intelligence-generated news anchor.[18][19][20]

In 2018, the State Council budgeted $2.1 billion for an AI industrial park in Mentougou district.[21] In order to achieve this the State Council stated the need for massive talent acquisition, theoretical and practical developments, as well as public and private investments.[14] Some of the stated motivations that the State Council gave for pursuing its AI strategy include the potential of artificial intelligence for industrial transformation, better social governance and maintaining social stability.[14] As of the end of 2020, Shanghai's Pudong District had 600 AI companies across foundational, technical, and application layers, with related industries valued at around 91 billion yuan.[22]

In 2019, the application of artificial intelligence expanded to various fields such as quantum physics, geography, and medical research. With the emergence of large language models (LLMs), at the beginning of 2020, Chinese researchers began developing their own LLMs. One such example is the multimodal large model called 'Zidongtaichu.'[23]

The Beijing Academy of Artificial Intelligence launched China's first large scale pre-trained language model in 2022.[24][25]:283

In November 2022, the Cyberspace Administration of China (CAC), Ministry of Industry and Information Technology, and the Ministry of Public Security jointly issued the regulations concerning deepfakes, which became effective in January 2023.[26]

In July 2023, Huawei released its version 3.0 of its Pangu LLM.[27]

In July 2023, China released its Interim Measures for the Administration of Generative Artificial Intelligence Services.[28]:96 A draft proposal on basic generative AI services safety requirements, including specifications for data collection and model training was issued in October 2023.[28]:96

Also in October 2023, the Chinese government launched its Global AI Governance Initiative, which aims to build AI policy dialogue with other developing countries.[28]:93 The Initiative has expressed concern over AI safety risks, including abuse of data or the use of AI by terrorists.[28]:93

In 2024, Spamouflage, an online disinformation and propaganda campaign of the Ministry of Public Security, began using news anchors created with generative artificial intelligence to deliver fake news clips.[18]

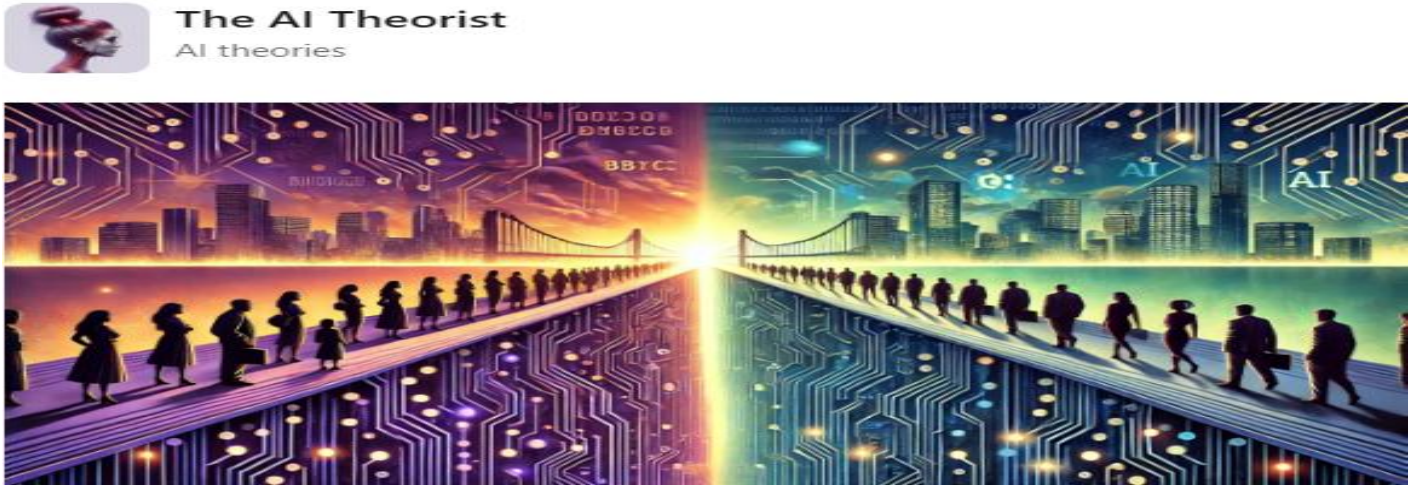
In March 2024, Premier Li Qiang launched the AI+ Initiative, which intends to integrate AI into China's real economy.[28]:95

In May 2024, the Cyberspace Administration of China announced that it rolled out a large language model trained on Xi Jinping Thought.[29]

According to the 2024 report from the International Data Corporation (IDC), Baidu AI Cloud holds China's largest LLM market share with 19.9 percent and US$49 million in revenue over the last year. This was followed by SenseTime, with 16 percent market share, and by Zhipu AI, as the third largest. The fourth and fifth largest were Baichuan and the Hong-Kong listed AI company 4Paradigm respectively.[30] Baichuan, Zhipu AI, Moonshot AI and MiniMax were praised by investors as China's new "AI Tigers".[31] In April 2024, 117 generative AI models had been approved by the Chinese government.[32]

As of 2024, many Chinese technology firms such as Zhipu AI and Bytedance have launched AI video-generation tools to rival OpenAI's Sora.[33]

Chronology of major AI-related policies



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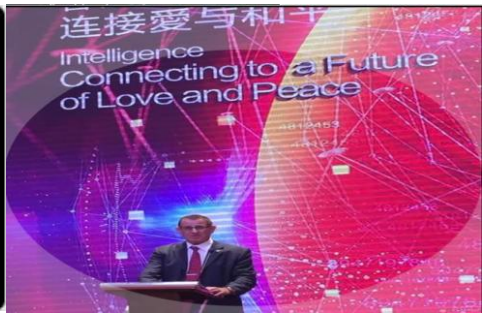
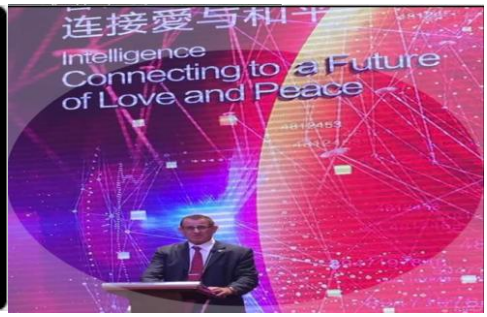
Year	Policy document	Issued by
2015	Made in China 2025	Premier Li Keqiang and his cabinet
2015	"Guiding Opinions of the State Council on Actively Promoting the "Internet Plus" Action" (国务院关于积极推进"互联网+"行动的指导意见)	State Council of the People's Republic of China

2016	Thirteenth Five-Year Plan of China (中华人民共和国国民经济和社会发展第十三个五年规划纲要)	State Council of the People's Republic of China
2016	"Internet +' AI Three-Year Implementation Plan" (新一代AI产业发展三年行动计划）	National Development and Reform Commission; Ministry of Science and Technology; Ministry of Industry and Information Technology; the Central Leading Group for Cyberspace Affairs
2017	"New Generation AI Development Plan" (新一代人工智能发展规划)	State Council of the People's Republic of China
2019	Guidelines for the Construction of the National New Generation Artificial Intelligence Open Innovation Platform" （国家新一代人工智能开放创新平台建设工作指引）	Ministry of Science and Technology
2020	"National New Generation of AI Standardization Guidance" (国家新一代人工智能标准体系建设指南)	National Standardization Administration; Central Cyberspace Administration; National Development and Reform Commission; Ministry of Science and Technology Ministry of Industry and Information Technology
2021	Fourteenth Five-Year Plan of China (中华人民共和国国民经济和社会发展第十四个五年规划纲要)	State Council of the People's Republic of China
2021	"A new generation of artificial intelligence ethics code" （新一代人工智能伦理规范）	Ministry of Science and Technology
2021	China's Data Security Law (中华人民共和国数据安全法)	State Council of the People's Republic of China

CHINA Government goals

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According to a February 2019 publication by the Center for a New American Security, CCP general secretary Xi Jinping – believes that being at the forefront of AI technology will be critical to the future of global military and economic power competition.[34] By 2025, the State Council aims for China to make fundamental contributions to basic AI theory and to solidify its place as a global leader in AI research. Further, the State Council aims for AI to become "the main driving force for China's industrial upgrading and economic transformation" by this time.[14] By 2030, the State Council aims to have China be the global leader in the development of artificial intelligence theory and technology. The State Council claims that China will have developed a "mature new-generation AI theory and technology system."[14]

According to academics Karen M. Sutter and Zachary Arnold, the Chinese government "seeks to meld state planning and control while some operational flexibility for firms. In this context, China's AI firms are hybrid players. The state guides their activity, funds, and shields them from foreign competition through domestic market protections, creating asymmetric advantages as they expand offshore."[35]

The CCP's fourteenth five-year plan reaffirmed AI as a top research priority and ranks AI first among "frontier industries" that the Chinese government aims to focus on through 2035.[3] The AI industry is a strategic sector often supported by China's government guidance funds.[36]: 167

Research and development

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Chinese public AI funding mainly focused on advanced and applied research.[37] The government funding also supported multiple AI R&D in the private sector through venture capitals that are backed by the state.[37] Much analytic agency research showed that, while China is massively investing in all aspects of AI development, facial recognition, biotechnology, quantum computing, medical intelligence, and autonomous vehicles are AI sectors with the most attention and funding.[38]

According to national guidance on developing China's high-tech industrial development zones by the Ministry of Science and Technology, there are fourteen cities and one county selected as an experimental development zone.[39] Zhejiang and Guangdong provinces have the most AI innovation in experimental areas. However, the focus of AI R&D varied depending on cities and local industrial development and ecosystem. For instance, Suzhou, a city with a longstanding strong manufacturing industry, heavily focuses on automation and AI infrastructure while Wuhan focuses more on AI implementations and the education sector.[39] In connection with universities, tech firms, and national ministries, Shenzhen and Hangzhou each co-founded generative AI labs.[25]: 282

In 2016 and 2017, Chinese teams won the top prize at the Large Scale Visual Recognition Challenge, an international competition for computer vision systems.[40] Many of these systems are now being integrated into China's domestic surveillance network.[41]

Interdisciplinary collaborations play an essential role in China's AI R&D, including academic-corporate collaboration, public-private collaborations, and international collaborations and projects with corporate-government partnerships are the most common.[1] China ranked in the top three worldwide following the United States and the European Union for the total number of peer-reviewed AI publications that are produced under a corporate-academic partnership between 2015 and 2019.[42] Besides, according to an AI index report, China surpassed the U.S. in 2020 in the total number of global AI-related journal citations.[42] In terms of AI-related R&D, China-based peer-reviewed AI papers are mainly sponsored by the government. In May 2021, China's Beijing Academy of Artificial Intelligence released the world's largest pre-trained language model (WuDao).[43]

As of 2023, 47% of the world's top AI researchers had completed their undergraduate studies in China.[28]:101

According to academic Angela Huyue Zhang, publishing in 2024, while the Chinese government has been proactive in regulating AI services and imposing obligations on AI companies, the overall approach to its regulation is loose and demonstrates a pro-growth policy favorable to China's AI industry.[28]:96 In July 2024, the government opened its first algorithm registration center in Beijing.[44]

Population

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China's large population generates a massive amount of accessible data for companies and researchers, which offers a crucial advantage in the race of big data. As of 2024, China has the world's largest number of internet users, generating huge amounts of data for machine learning and AI applications.[45]:18

Facial recognition

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Facial recognition is one of the most widely employed AI applications in China. Collecting these large amounts of data from its residents helps further train and expand AI capabilities. China's market is not only conducive and valuable for corporations to further AI R&D but also offers tremendous economic potential attracting both international and domestic firms to join the AI market. The drastic development of the information and communication technology (ICT) industry and AI chipsets in recent years are two examples of this.[46] China has become the world's largest exporter of facial recognition technology, according to a January 2023 *Wired* report.[47]

Censorship and content controls

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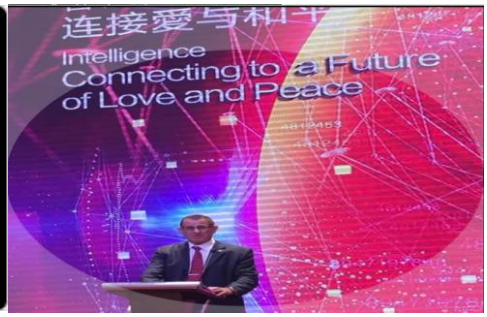

Further information: Internet censorship in China

In April 2023,[48] the Cyberspace Administration of China (CAC) issued draft measures stating that tech companies will be obligated to ensure AI-generated content upholds the ideology of the CCP including Core Socialist Values, avoids discrimination, respects intellectual property rights, and safeguards user data.[49][25]:278 Under these draft measures, companies bear legal responsibility for training data and content generated through their platforms.[25]:278 In October 2023, the Chinese government mandated that generative artificial intelligence-produced content may not "incite subversion of state power or the overthrowing of the socialist system."[50] Before releasing a large language model to the public, companies must seek approval from the CAC to certify that the model refuses to answer certain questions relating to political ideology and criticism of the CCP.[8][51] Questions related to politically sensitive topics such as the 1989 Tiananmen Square protests and massacre or comparisons between Xi Jinping and Winnie the Pooh must be declined.[51]

In 2023, in-country access was blocked to Hugging Face, a company that maintains libraries containing training data sets commonly used for large language models.[8] A subsidiary of the *People's Daily*, the official newspaper of the Central Committee of the Chinese Communist Party, provides local companies with training data that CCP leaders consider permissible.[8] In 2024, the *People's Daily* released a LLM-based tool called Easy Write.[52]

Microsoft has warned that the Chinese government uses generative artificial intelligence to interfere in foreign elections by spreading disinformation and provoking discussions on divisive political issues.[53][54][55]

Impact

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Economic impact

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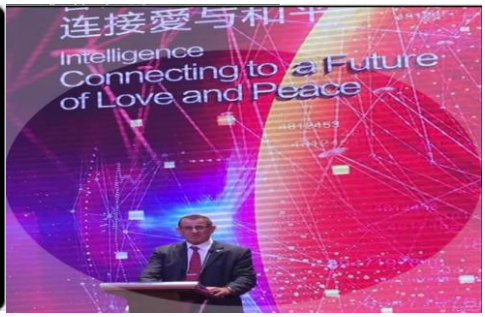
Most agencies[*who?*] hold optimistic views about AI's economic impact on China's long-term economic growth. In the past, traditional industries in China have struggled with the increase in labor costs due to the growing aging population in China and the low birth rate. With the deployment of AI, operational costs are expected to reduce while an increase in efficiency generates revenue growth.[56] Some highlight the importance of a clear policy and governmental support in order to overcome adoption barriers including costs and lack of properly trained technical talents and AI awareness.[57] However, there are concerns about China's deepening income inequality and the ever-expanding imbalanced labor market in China. Low- and medium-income workers might be the most negatively impacted by China's AI development because of rising demands for laborers with advanced skills.[57] Furthermore, China's economic growth might be disproportionately divided as a majority of AI-related industrial development is concentrated in coastal regions rather than inland.[57]

An influential decision by the Beijing Internet Court has ruled that AI-generated content is entitled to copyright protection.[28]:98

Military impact

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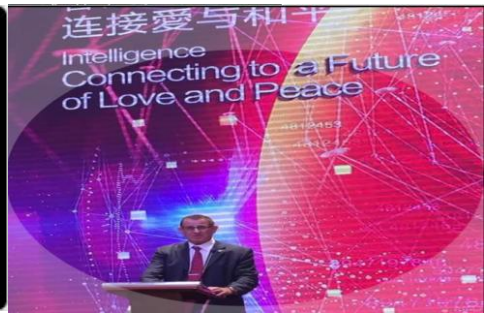
China seeks to build a "world-class" military by "intelligentization" with a particular focus on the use of unmanned weapons and artificial intelligence.[58][59] It is researching various types of air, land, sea, and undersea autonomous vehicles. In the spring of 2017, a civilian Chinese university with ties to the military demonstrated an AI-enabled swarm of 1,000 uninhabited aerial vehicles at an airshow. A media report released afterwards showed a computer simulation of a similar swarm formation finding and destroying a missile launcher.[4]:23 Open-source publications indicated that China is also developing a suite of AI tools for cyber operations.[60][4]:27 Chinese development of military AI is largely influenced by China's observation of U.S. plans for defense innovation and fears of a widening "generational gap" in comparison to the U.S. military. Similar to U.S. military concepts, China aims to use AI for exploiting large troves of intelligence, generating a common operating picture, and accelerating battlefield decision-making.[60][4]:12-14 The Chinese Multi-Domain Precision Warfare (MDPW) is considered China's response to the U.S. Joint All-Domain Command and Control (JADC2) strategy, which seeks to integrate sensors and weapons with AI and a vigorous network.[61][62]

Twelve categories of military applications of AI have been identified: UAVs, USVs, UUVs, UGVs, intelligent munitions, intelligent satellites, ISR (Intelligence, Surveillance and Reconnaissance) software, automated cyber defense software, automated cyberattack software, decision support, software, automated missile launch software, and cognitive electronic warfare software.[63]

China's management of its AI ecosystem contrasts with that of the United States.[4]:6 In general, few boundaries exist between Chinese commercial companies, university research laboratories, the military, and the central government. As a result, the Chinese government has a direct means of guiding AI development priorities and accessing technology that was ostensibly developed for civilian purposes. To further strengthen these ties the Chinese government created a Military-Civil Fusion Development Commission which is intended to speed the transfer of AI technology from commercial companies and research institutions to the military in January 2017.[2][4]:19 In addition, the Chinese government is leveraging both lower barriers to data collection and lower costs of data labeling to create the large databases on which AI systems train.[64] According to one estimate, China is on track to possess 20% of the world's share of data by 2020, with the potential to have over 30% by 2030.[60][4]:12

China's centrally directed effort is investing in the U.S. AI market, in companies working on militarily relevant AI applications, potentially granting it lawful access to U.S. technology and intellectual property.[65] Chinese venture capital investment in U.S. AI companies between 2010 and 2017 totaled an estimated $1.3 billion.[66][60] In September 2022, the U.S. Biden administration issued an executive order to prevent foreign investments, "particularly those from competitor or adversarial nations," from investing in U.S. technology firms, due to U.S. national security concerns.[67][68] The order covers fields of U.S. technologies in which Chinese government has been investing, including "microelectronics, artificial intelligence, biotechnology and biomanufacturing, quantum computing, [and] advanced clean energy."[67][68]

In 2024, researchers from the People's Liberation Army Academy of Military Sciences were reported to have developed a military tool using Llama, which Meta Platforms said was unauthorized due to its model use prohibition for military purposes.[69][70]

Academia

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Although in 2004, Peking University introduced the first academic course on AI which led other Chinese universities to adopt AI as a discipline, especially since China faces challenges in recruiting and retaining AI engineers and researchers.[21] Over half of the data scientists in the United States have been working in the field for over 10 years, while roughly the same proportion of data scientists in China have less than 5 years of experience. As of 2017, fewer than 30 Chinese Universities produce AI-focused experts and research products.[57]:8 Although China surpassed the United States in the number of research papers produced from 2011 to 2015, the quality of its published papers, as judged by peer citations, ranked 34th globally.[71] China especially want to address military applications and so the Beijing Institute of Technology, one of China's premier institutes for weapons research, recently established the first children's educational program in military AI in the world.[72]

In 2019, 34% of Chinese students studying in the AI field stayed in China for work.[73] According to a database maintained by an American thinktank, the percentage increased to 58% in 2022.[73]

Ethical concerns

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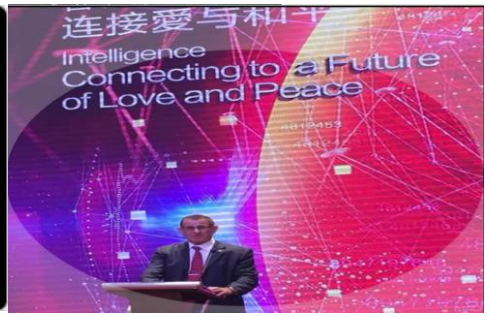
For the past years, there are discussions about AI safety and ethical concerns in both private and public sectors. In 2021, China's Ministry of Science and Technology published the first national ethical guideline, '*the New Generation of Artificial Intelligence Ethics Code*' on the topic of AI with specific emphasis on user protection, data privacy, and security.[74] This document acknowledges the power of AI and quick technology adaptation by the big corporations for user engagements. The *South China Morning Post* reported that humans shall remain in full decision-making power and rights to opt-in/-out.[74] Before this, the Beijing Academy of Artificial Intelligence published the *Beijing AI principles* calling for essential needs in long-term research and planning of AI ethical principles.[75]

Data security has been the most common topic in AI ethical discussion worldwide, and many national governments have established legislation addressing data privacy and security. The Cybersecurity Law of the People's Republic of China was enacted in 2017 aiming to address new challenges raised by AI development.[76][*original research?*] In 2021, China's new Data Security Law (DSL) was passed by the PRC congress, setting up a regulatory framework classifying all kinds of data collection and storage in China.[77] This means all tech companies in China are required to classify their data into categories listed in Digital Subscriber Line (DSL) and follow specific guidelines on how to govern and handle data transfers to other parties.[77]

Judicial system

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Further information: Judicial system of China

In 2019, the city of Hangzhou established a pilot program artificial intelligence-based Internet Court to adjudicate disputes related to ecommerce and internet-related intellectual property claims.[78]:124 Parties appear before the court via videoconference and AI evaluates the evidence presented and applies relevant legal standards.[78]:124

Because some controversial cases that drew public criticism for their low punishments have been withdrawn from China Judgments Online, there are concerns about whether AI based on fragmented judicial data can reach unbiased decisions.[79] Zhang Linghan, professor of law at the China University of Political Science and Law, writes that AI-technology companies may erode judicial power.[80] Some scholars argued that “increasing party leadership, political oversight, and reducing the discretionary space of judges are intentional goals of SCR [smart court reform].”[81]

Leading companies

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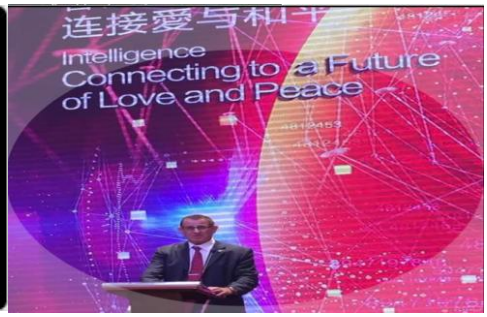
Leading AI-centric companies and start-ups include Baidu, Tencent, Alibaba, SenseTime, 4Paradigm and Yitu Technology.[82] Chinese AI companies iFlytek, SenseTime, Cloudwalk and DJI have received attention for facial recognition, sound recognition and drone technologies.[83]

China's government takes a market-oriented approach to AI, and has sought to encourage private tech companies in developing AI.[25]:281 In 2018, it designated Baidu, Alibaba, iFlytek, Tencent, and SenseTime as "AI champions".[25]:281

In 2023, Tencent debuted its large language model Hunyuan for enterprise use on Tencent Cloud.[84]

New leading AI startups include Baichuan, Zhipu AI, Moonshot AI and MiniMax which were praised by investors as China's new "AI Tigers" in 2024.[31] 01.AI has also been touted as a leading startup.[85]

Year	Company	Designated AI Specialty
2017	Alibaba Cloud (阿里云)	Smart City Brain
2017	Baidu (百度)	Autonomous Vehicle
2017	Tencent (腾讯)	Medical Intelligence
2017	iFlytek (科大讯飞)	Voice Recognition

2018	SenseTime (商汤)	Intelligent Vision
2019	Yitu (依图科技)	Visual Computing
2019	Minglamp Technology (明略科技)	Intelligent Marketing
2019	Huawei (华为)	Software and Hardware
2019	Pingan (中国平安)	Financial Intelligence
2019	Hikvision (海康威视)	Video Perception
2019	JD.com (京东)	Smart Supply Chain
2019	Megvii (旷世科技)	Visual Perception
2019	Qihoo 360 (奇虎360)	Security and Smart Brain
2019	TAL Education Group (好未来)	Education
2019	Xiaomi (小米)	Home Automation

Assessment

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Academic Jinghan Zeng argued the Chinese government's commitment to global AI leadership and technological competition was driven by its previous underperformance in innovation which was seen by the CCP as a part of the century of humiliation.[86] According to Zeng, there are historically embedded causes of China's anxiety towards securing an international technological dominance – China missed both industrial revolutions, the one starting in Britain in the mid-18th century, and the one that originated in America in the late-19th century.[86] Therefore, China's government desires to take advantage of the technological revolution in today's world led by digital technology including AI to resume China's "rightful" place and to pursue the national rejuvenation proposed by Xi Jinping.[86]

An article published by the Center for a New American Security concluded that "Chinese government officials demonstrated remarkably keen understanding of the issues surrounding AI and international security. This includes knowledge of the U.S. AI policy discussions," and recommended that "the U.S. policymaking community to similarly

prioritize cultivating expertise and understanding of AI developments in China" and "funding, focus, and a willingness among U.S. policymakers to drive large-scale necessary change."[34] An article in the *MIT Technology Review* similarly concluded: "China might have unparalleled resources and enormous untapped potential, but the West has world-leading expertise and a strong research culture. Rather than worry about China's progress, it would be wise for Western nations to focus on their existing strengths, investing heavily in research and education."[87]

The Chinese government's censorship regime has stunted the development of generative artificial intelligence.[7][8]

In a 2021 text, the Research Centre for a Holistic Approach to National Security at the China Institutes of Contemporary International Relations wrote that the development of AI creates challenges for holistic national security, including the risks that AI will heighten social tensions or have destabilizing effects on international relations.[28]:49

Writing from a Chinese Marxist view, academics including Gao Qiqi and Pan Enrong contend that capitalist application of AI will lead to greater oppression of workers and more serious social problems.[28]:90 Gao cites how the development of AI has increased the power of platform companies like Meta, Twitter, and Alphabet, leading to greater capital accumulation and political power in fewer economic actors.[28]:90 According to Gao, the state should be the primary responsible actor in the area of generative AI (creating new content like music or video).[28]:92 Gao writes that military use of AI risks escalating military competition between countries and that the impact of AI in military matters will not be limited to one country but will have spillover effects.[28]:91 Gao cites the example of U.S. military use of AI, which he contends has been used as a scapegoat to evade accountability for decision-making.[28]:91

Public polling

[-]

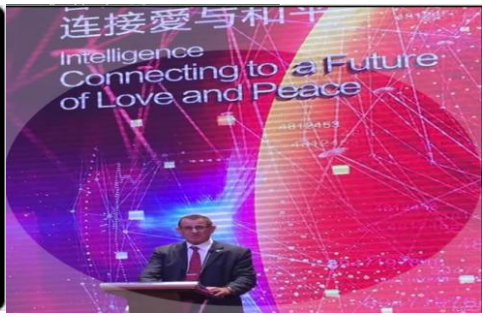
The Chinese public is generally optimistic regarding AI.[25]:283[28]:101 A 2021 study conducted across 28 countries found that 78% of the Chinese public believes the benefits of AI outweigh the risks, the highest of any country in the study.[25]:283 In 2024, a survey of elite Chinese university students found that 80% agreed or strongly agreed that AI will do more good than harm for society, and 31% believed it should be regulated by the government.[88]

Human rights

[-]

The widely used AI facial recognition has raised concerns.[89] According to *The New York Times*, deployment of AI facial recognition technology in the Xinjiang region to detect Uyghurs is "the first known example of a government intentionally using artificial intelligence for racial profiling,"[90] which is said to be “one of the most striking examples of digital authoritarianism."[91] Researchers have found that in China, areas experiencing higher rates of unrest are associated with increased state acquisition of AI facial recognition technology, especially by local municipal police departments.[92][93]

See also

[-]

- Artificial intelligence
- Artificial intelligence arms race
- China Brain Project
- Fifth generation computer
- List of artificial intelligence companies
- Regulation of artificial intelligence

References

[-]

1. ^ Jump up to:[a] [b] *Chang, Huey-Meei; Hannas, William C. (2022-06-22), "Foreign support, alliances, and technology transfer", Chinese Power and Artificial Intelligence (1 ed.), London: Routledge, pp. 36–54, doi:10.4324/9781003212980-4, ISBN 978-1-003-21298-0*

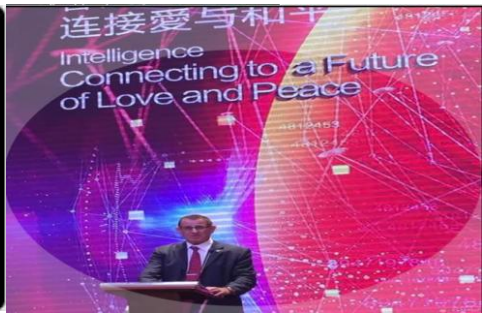
2. ^ Jump up to:[a] [b] [c] *He, Yujia (2017). How China is preparing for an AI-powered Future (PDF). Woodrow Wilson International Center for Scholars. Archived (PDF) from the original on 2021-02-15. Retrieved 2020-04-30.*

3. ^ Jump up to:[a] [b] [c] [d] [e] *Luong, Ngor; Fedasiuk, Ryan (2022-06-22), "State plans, research, and funding", Chinese Power and Artificial Intelligence (1 ed.), London: Routledge, pp. 3–18, doi:10.4324/9781003212980-2, ISBN 978-1-003-21298-0*

4. ^ Jump up to:[a] [b] [c] [d] [e] [f] [g] *Kania, Elsa B. (November 28, 2017). Battlefield Singularity: Artificial Intelligence, Military Revolution, and China's Future Military Power. Washington D.C: Center for a New American Security. OCLC 1029611044. Archived from the original on January 14, 2024. Retrieved February 16, 2024.*

5. ^ *Allen, Gregory (11 October 2022). "Choking off China's Access to the Future of AI". Center for Strategic and International Studies. Archived from the original on 12 October 2022. Retrieved 12 October 2022.*

6. ^ *Allen, Gregory C.; Benson, Emily (2023-03-01). "Clues to the U.S.-Dutch-Japanese Semiconductor Export Controls Deal Are Hiding in Plain Sight". Center for Strategic and International Studies. Archived from the original on 2023-03-03. Retrieved 2023-03-03.*

7. ^ Jump up to:[a] [b] *Zhang, Daqiu; Lin, Yujie (2024-07-02). "生成中国式AI：审查之外，科技公司的烦恼清单" [Building a Chinese AI: Beyond censorship, tech companies' list of worries]. Initium Media (in Simplified Chinese). Archived from the original on 2024-07-11. Retrieved 2024-07-11.*

8. ^ Jump up to:[a] [b] [c] [d] [e] *Lin, Liza (July 15, 2024). "China Puts Power of State Behind AI—and Risks Strangling It". The Wall Street Journal. Archived from the original on July 16, 2024. Retrieved July 16, 2024.*

9. ^ Jump up to:[a] [b] [c] [d] *蔡自兴 (13 August 2016). "中国人工智能40 年". 科技导报 (in Chinese). **34** (15): 12–32. doi:10.3981/j.issn.1000-7857.2016.15.001 (inactive 1 November 2024). ISSN 1000-7857. Archived from the original on 2022-01-20. Retrieved 2022-02-07.*

10. ^ "Introduction to the Chinese Association of Artificial Intelligence". *中国人工智能学会*.

11. ^ *Liu, Wei (2023), Liu, Wei (ed.), "From Adjustment to Innovation: How China's Economic Structure Has Been Upgraded", China's 40 Years of Reform, Understanding China, Singapore: Springer Nature Singapore, pp. 11–33, doi:10.1007/978-981-19-8505-8_2, ISBN 978-981-19-8504-1*

12. ^ Jump up to:[a] [b] *"【人民网】世界人工智能国际联合大会今秋将首次在中国举行----中国科学院". www.cas.cn. Archived from the original on 2023-05-04. Retrieved 2023-05-05.*

13. ^ *"科学网—首届吴文俊人工智能科学技术奖颁奖". news.sciencenet.cn. Archived from the original on 2023-05-04. Retrieved 2023-05-05.*

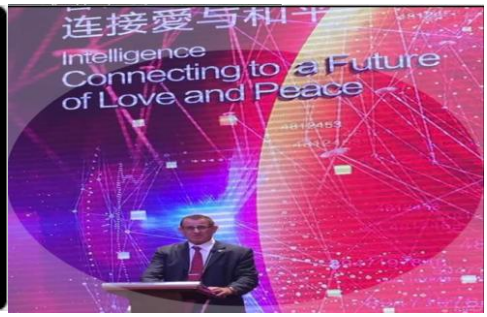
14. ^ Jump up to:[a] [b] [c] [d] [e] *"State Council Notice on the Issuance of the Next Generation Artificial Intelligence Development Plan" (PDF). New America. Archived (PDF) from the original on April 13, 2018. Retrieved April 2, 2018.*

15. ^ *Laskai, Lorand (29 January 2018). "Civil-Military Fusion: The Missing Link Between China's Technological and Military Rise". Council on Foreign Relations. Archived from the original on 18 July 2020. Retrieved 3 June 2020.*

16. ^ *"【中国科学报】"人工智能+"应上升为国家战略----中国科学院". www.cas.cn. Archived from the original on 2023-05-04. Retrieved 2023-05-05.*

17. ^ *"【人民网】强强联合建医疗"阿尔法狗" 人工智能将问诊肿瘤----中国科学院". www.cas.cn. Archived from the original on 2023-05-04. Retrieved 2023-05-05.*

18. ^ Jump up to:[a] [b] *Milmo, Dan; Hawkins, Amy (2024-05-18). "How China is using AI news anchors to deliver its propaganda". The Guardian. ISSN 0261-3077. Archived from the original on 2024-05-25. Retrieved 2024-05-19.*

19. ^ *Kuo, Lily (2018-11-09). "World's first AI news anchor unveiled in China". The Guardian. ISSN 0261-3077. Archived from the original on 2024-02-20. Retrieved 2024-05-19.*

20. ^ *Steger, Isabella (2019-02-20). "Chinese state media's latest innovation is an AI female news anchor". Quartz. Archived from the original on 2024-05-19. Retrieved 2024-05-19.*

21. ^ Jump up to: *Cyranoski, David (January 17, 2018). "China enters the battle for AI talent". Nature. **553** (7688): 260–261. Bibcode:2018Natur.553..260C. doi:10.1038/d41586-018-00604-6. PMID 29345655.*

22. ^ *Liu, Zhiyi; Zheng, Yejie (2022-04-03). "Development paradigm of artificial intelligence in China from the perspective of digital economics". Journal of Chinese Economic and Business Studies. **20** (2): 207–217. doi:10.1080/14765284.2022.2081485. ISSN 1476-5284. S2CID 249301337.*

23. ^ *"自动化所研发出跨模态通用人工智能平台"紫东太初"----中国科学院". www.cas.cn. Archived from the original on 2023-05-04. Retrieved 2023-05-05.*

24. ^ *"Beijing-funded AI language model tops Google and OpenAI in raw numbers". South China Morning Post. 2021-06-02. Archived from the original on 2023-11-19. Retrieved 2024-05-21.*

25. ^ Jump up to: *Zhang, Angela Huyue (2024). High Wire: How China Regulates Big Tech and Governs Its Economy. Oxford University Press. doi:10.1093/oso/9780197682258.001.0001. ISBN 9780197682258.*

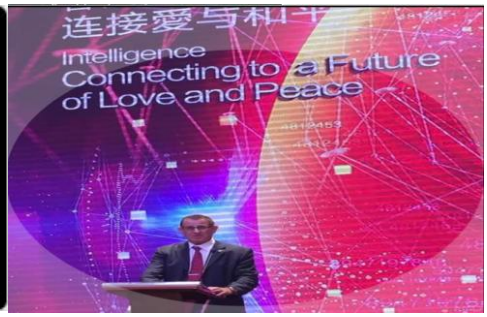
26. ^ *Zhang, Laney (April 26, 2023). "China: Provisions on Deep Synthesis Technology Enter into Effect". Law Library of Congress. Archived from the original on 2024-08-16. Retrieved 2024-08-19.*

27. ^ *"Huawei unveils Arabic LLM, new data centre in Egypt as part of generative AI push". South China Morning Post. 2024-05-21. Archived from the original on 2024-05-25. Retrieved 2024-05-21.*

28. ^ Jump up to: *Bachulska, Alicja; Leonard, Mark; Oertel, Janka (2 July 2024). The Idea of China: Chinese Thinkers on Power, Progress, and People (EPUB). Berlin, Germany: European Council on Foreign Relations. ISBN 978-1-916682-42-9. Archived from the original on 17 July 2024. Retrieved 22 July 2024.*

29. ^ *Zhuang, Sylvie (21 May 2024). "China rolls out large language model AI based on Xi Jinping Thought". South China Morning Post. Archived from the original on 21 May 2024. Retrieved 21 May 2024.*

30. ^ *"Baidu, SenseTime lead China's market for business-focused LLMs, says IDC". South China Morning Post. 2024-08-22. Retrieved 2024-08-24.*

31. ^ Jump up to:[a] [b] *"China's 4 new 'AI tigers' emerge as investor favourites"*. *South China Morning Post. 2024-04-19. Retrieved 2024-08-24.*

32. ^ *"China's AI startups race for customers as titans like Alibaba cut prices"*. *Nikkei Asia. Retrieved 2024-08-24.*

33. ^ *"Chinese AI firms fight to stand out from rivals in text-to-video market"*. *South China Morning Post. 2024-08-08. Retrieved 2024-08-24.*

34. ^ Jump up to:[a] [b] *Allen, Gregory C. (2019). Understanding China's AI Strategy: Clues to Chinese Strategic Thinking on Artificial Intelligence and National Security (Report). Center for a New American Security. JSTOR resrep20446. Archived from the original on 2019-02-07. Retrieved 2019-03-11.*

35. ^ *Sutter, Karen M.; Arnold, Zachary (2022-06-22), "China's AI companies: Hybrid players", Chinese Power and Artificial Intelligence (1 ed.), London: Routledge, pp. 19–35, doi:10.4324/9781003212980-3, ISBN 978-1-003-21298-0*

36. ^ *Lan, Xiaohuan (2024). How China Works: An Introduction to China's State-led Economic Development. Translated by Topp, Gary. Palgrave Macmillan. doi:10.1007/978-981-97-0080-6. ISBN 978-981-97-0079-0.*

37. ^ Jump up to:[a] [b] *Ashwin Acharya; Zachary Arnold (December 2019). "Chinese Public AI R&D Spending: Provisional Findings". Center for Security and Emerging Technology. doi:10.51593/20190031. S2CID 242961679. Archived from the original on 2024-04-10. Retrieved 2024-04-10.*

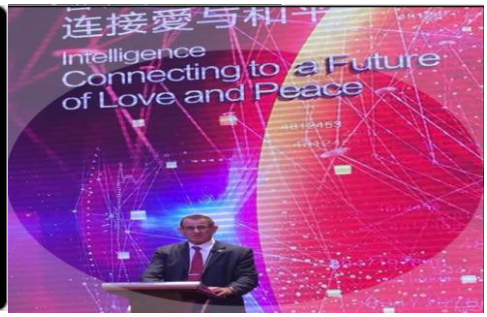
38. ^ *Larson, Christina (8 February 2018). China's massive investment in artificial intelligence has an insidious downside (Report). Science. doi:10.1126/science.aat2458.*

39. ^ Jump up to:[a] [b] *21世纪经济报道 (2021-07-10). "解码人工智能"国家队"". finance.sina.com.cn. Archived from the original on 2023-04-09. Retrieved 2024-02-16.*

40. ^ *Tilley, Aaron. "China's Rise In The Global AI Race Emerges As It Takes Over The Final ImageNet Competition". Forbes. Archived from the original on 2019-05-28. Retrieved 2020-04-30.*

41. ^ *"Beijing to Judge Every Resident Based on Behavior by End of 2020". Bloomberg News. Archived from the original on 2020-05-16.*

42. ^ Jump up to:[a] [b] *Zhang, Daniel; Mishra, Saurabh; Brynjolfsson, Erik; Etchemendy, John; Ganguli, Deep; Grosz, Barbara; Lyons, Terah; Manyika, James; Niebles, Juan Carlos (2021-03-08), The AI Index 2021 Annual Report, arXiv:2103.06312*

43. ^ *Heikkilä, Melissa (June 9, 2021). "Meet Wu Dao 2.0, the Chinese AI model making the West sweat". Politico. Archived from the original on April 7, 2023. Retrieved April 7, 2023.*

44. ^ *Ho, C. (October 15, 2024). "PRC Launches First Algorithm Registration Center, Strengthening AI and Data Regulation". Jamestown Foundation. Retrieved 2024-10-18.*

45. ^ *Li, David Daokui (2024). China's World View: Demystifying China to Prevent Global Conflict. New York, NY: W. W. Norton & Company. ISBN 978-0393292398.*

46. ^ *Li, Daitian; Tong, Tony W.; Xiao, Yangao (2021-02-18). "Is China Emerging as the Global Leader in AI?". Harvard Business Review. ISSN 0017-8012. Archived from the original on 2024-01-20. Retrieved 2024-02-16.*

47. ^ *Knight, Will (January 24, 2023). "China Is the World's Biggest Face Recognition Dealer". Wired. ISSN 1059-1028. Archived from the original on 2024-02-25. Retrieved 2024-02-25.*

48. ^ *Bandurski, David (April 14, 2023). "Bringing AI to the Party". China Media Project. Archived from the original on April 15, 2023. Retrieved April 15, 2023.*

49. ^ *Liu, Qianer (2023-07-11). "China to lay down AI rules with emphasis on content control". Financial Times. Archived from the original on 2024-05-25. Retrieved 2024-05-21.*

50. ^ *"China is shoring up the great firewall for the AI age". The Economist. December 26, 2023. ISSN 0013-0613. Archived from the original on 2023-12-26. Retrieved 2023-12-26.*

51. ^ Jump up to:[a] [b] *McMorrow, Ryan; Hu, Tina (July 17, 2024). "China deploys censors to create socialist AI". Financial Times. Archived from the original on July 17, 2024. Retrieved July 17, 2024.*

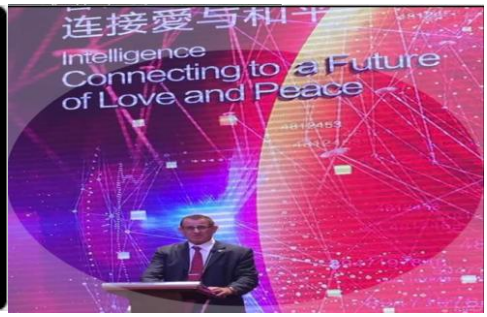
52. ^ *Colville, Alex (2024-11-27). "The Party in the Machine". China Media Project. Retrieved 2024-11-30.*

53. ^ *Lyngaas, Sean (2023-09-07). "Suspected Chinese operatives using AI generated images to spread disinformation among US voters, Microsoft says". CNN. Archived from the original on 2024-04-02. Retrieved 2024-04-08.*

54. ^ *Milmo, Dan (2024-04-05). "China will use AI to disrupt elections in the US, South Korea and India, Microsoft warns". The Guardian. ISSN 0261-3077. Archived from the original on 2024-05-25. Retrieved 2024-04-08.*

55. ^ *Farrell, James (April 5, 2024). "China Eying Election Disruption Campaigns—Including With AI, Microsoft Says". Forbes. Archived from the original on April 8, 2024. Retrieved April 8, 2024.*

56. ^ *"How China Is Using AI to Fuel the Next Industrial Revolution". Time. Archived from the original on 2022-02-05. Retrieved 2022-02-04.*

57. ^ Jump up to:[a] [b] [c] [d] *"Artificial intelligence: Implications for China"*. *McKinsey & Company*. *Archived from the original on 2024-02-04. Retrieved 2024-02-16.*

58. ^ *Bresnick, Sam (June 2024). "China's Military AI Roadblocks". Center for Security and Emerging Technology. doi:10.51593/20230042 (inactive 1 November 2024). Archived from the original on 2024-06-18. Retrieved 2024-06-18.*

59. ^ *Takagi, Koichiro (November 16, 2022). "Xi Jinping's Vision for Artificial Intelligence in the PLA". The Diplomat. Archived from the original on February 18, 2024. Retrieved February 17, 2024.*

60. ^ Jump up to:[a] [b] [c] [d] *Artificial Intelligence and National Security (PDF). Washington, DC: Congressional Research Service. 2019. Archived (PDF) from the original on 2020-05-08. Retrieved 2020-04-30.* This article incorporates text from this source, which is in the public domain.

61. ^ *Magnuson, Stew (July 13, 2023). "China Pursues Its Own Version of JADC2". National Defense. Archived from the original on February 18, 2024. Retrieved February 17, 2024.*

62. ^ *"China Military Power Report Examines Changes in Beijing's Strategy". U.S. Department of Defense. November 29, 2022. Archived from the original on May 25, 2024. Retrieved February 17, 2024.*

63. ^ *Fedasiuk, Ryan (August 2020). Chinese Perspectives on AI and Future Military Capabilities (Report). Center for Security and Emerging Technology. doi:10.51593/20200022.*

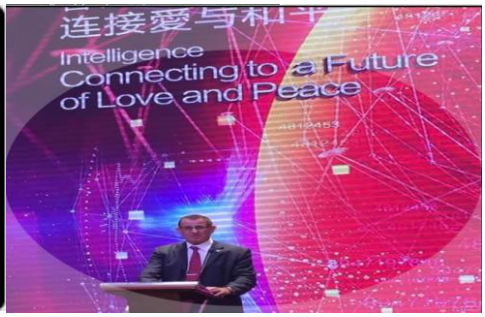
64. ^ *Knight, Will (October 10, 2017). "China's AI Awakening 中国人工智能的崛起". MIT Technology Review. Archived from the original on 2020-05-13. Retrieved 2020-04-30.*

65. ^ *Mozur, Paul; Markoff, John (2017-05-27). "Is China Outsmarting America in A.I.?". The New York Times. ISSN 0362-4331. Archived from the original on 2020-04-07. Retrieved 2020-04-30.*

66. ^ *Brown, Michael; Singh, Pavneet (2018). China's Technology Transfer Strategy: How Chinese Investments in Emerging Technology Enable A Strategic Competitor to Access the Crown Jewels of U.S. Innovation (PDF). Defense Innovation Unit Experimental. p. 29. Archived (PDF) from the original on 2020-04-12. Retrieved 2020-04-30.*

67. ^ Jump up to:[a] [b] *Kan, Michael (September 15, 2022). "Biden Curbs China's Investment in US Tech Firms With New Executive Order". PC Magazine. Archived from the original on February 20, 2024. Retrieved February 19, 2024.*

68. ^ Jump up to:[a] [b] *Sanger, David E. (2022-09-15). "Biden Issues New Order to Block Chinese Investment in Technology in the U.S." The New York Times. ISSN 0362-4331. Archived from the original on 2024-02-20. Retrieved 2024-02-20.*

69. ^ *Cheung, Sunny (October 31, 2024). "PRC Adapts Meta's Llama for Military and Security AI Applications". Jamestown Foundation. Retrieved 2024-11-03.*

70. ^ *Pomfret, James; Pang, Jessie (November 1, 2024). "Chinese researchers develop AI model for military use on back of Meta's Llama". Reuters. Retrieved November 1, 2024.*

71. ^ *"Which countries and universities are leading on AI research?". Times Higher Education. 2017-05-22. Archived from the original on 2020-03-02. Retrieved 2020-04-30.*

72. ^ *"China's brightest children recruited to develop AI 'killer bots'". South China Morning Post. 2018-11-08. Archived from the original on 2020-01-09. Retrieved 2020-04-30.*

73. ^ Jump up to: *"China has become a scientific superpower". The Economist. ISSN 0013-0613. Retrieved 2024-09-27.*

74. ^ Jump up to: *"Chinese AI has new ethical guidelines that curb Big Tech's algorithms". South China Morning Post. 2021-10-03. Archived from the original on 2022-02-03. Retrieved 2022-02-04.*

75. ^ *Wu, Wenjun; Huang, Tiejun; Gong, Ke (March 2020). "Ethical Principles and Governance Technology Development of AI in China". Engineering. **6** (3): 302–309. Bibcode:2020Engin...6..302W. doi:10.1016/j.eng.2019.12.015.*

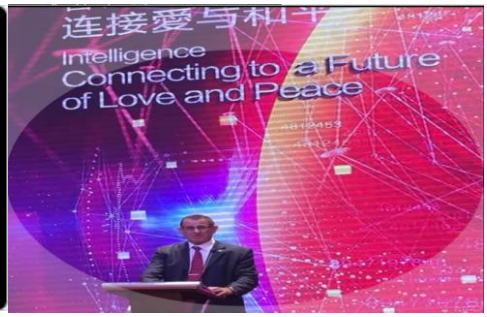
76. ^ *"Translation: Cybersecurity Law of the People's Republic of China (Effective June 1, 2017)". DigiChina. Archived from the original on 2022-02-04. Retrieved 2022-02-04.*

77. ^ Jump up to: Horwitz, Josh (2021-08-27). *"China's coming data laws leave firms with more questions than answers". Reuters. Archived from the original on 2022-02-04. Retrieved 2022-02-04.*

78. ^ Jump up to: Šimalčík, Matej (2023). "Rule by Law". In Kironska, Kristina; Turscanyi, Richard Q. (eds.). Contemporary China: a New Superpower?. Routledge. pp. 114–127. doi:10.4324/9781003350064-12. ISBN 978-1-03-239508-1.

79. ^ *Zhabina, Alena (January 20, 2023). "How China's AI is automating the legal system". Deutsche Welle. Archived from the original on March 29, 2024. Retrieved May 25, 2024.*

80. ^ *Chen, Stephen (2022-07-13). "China's court AI reaches into every corner of justice system: report". South China Morning Post. Archived from the original on 2024-03-31. Retrieved 2024-05-25. [H]umans will gradually lose free will with an increasing dependency on technology", she said in a paper published in the domestic peer-reviewed journal Law and Social Development on Sunday. The smart court system, built with the deep involvement of China's tech giants, would also pass too much power into the hands of a few technical experts who wrote the code, developed algorithms or supervised the database. "We must be alert to the erosion of judicial power by technology companies and capital," she added.*

81. ^ *Papagianneas, Straton; Junius, Nino (November 2023). "Fairness and justice through automation in China's smart courts". Computer Law & Security Review. **51**: 100–101. doi:10.1016/j.clsr.2023.105897. hdl:10067/2001290151162165141. Archived from the original on 2024-05-26. Retrieved 2024-05-26 – via Elsevier Science Direct.*

82. ^ *Pham, Sherisse (2018). "Chinese AI startup dwarfs global rivals with $4.5 billion valuation". CNN. Archived from the original on 9 April 2018. Retrieved 10 April 2018.*

83. ^ *"China ramps up tech education to become artificial intelligence leader". NBC News. 4 January 2020. Archived from the original on 2020-01-10. Retrieved 2020-01-10.*

84. ^ *Cao, Ann (2023-09-07). "Tencent launches Hunyuan foundation AI model for enterprises". South China Morning Post. Archived from the original on 2024-06-03. Retrieved 2024-06-03.*

85. ^ *Olcott, Eleanor (3 May 2024). "Four start-ups lead China's race to match OpenAI's ChatGPT". Financial Times.*

86. ^ Jump up to: *Zeng, Jinghan (2021-09-16). "Securitization of Artificial Intelligence in China". The Chinese Journal of International Politics. **14** (3): 417–445. doi:10.1093/cjip/poab005. ISSN 1750-8916.*

87. ^ *Knight, Will (October 10, 2017). "China's AI Awakening". MIT Technology Review. Archived from the original on March 24, 2018. Retrieved April 3, 2018.*

88. ^ *Corvino, Nick; Li, Boshen (August 23, 2024). "Survey: How Do Elite Chinese Students Feel About the Risks of AI?". Jamestown Foundation. Archived from the original on 2024-08-24. Retrieved 2024-08-23.*

89. ^ *Beraja, Martin; Kao, Andrew; Yang, David Y; Yuchtman, Noam (2023-06-23). "AI-tocracy". The Quarterly Journal of Economics. **138** (3): 1349–1402. doi:10.1093/qje/qjad012. ISSN 0033-5533.*

90. ^ *Mozur, Paul (2019-04-14). "One Month, 500,000 Face Scans: How China Is Using A.I. to Profile a Minority". The New York Times. ISSN 0362-4331. Archived from the original on 2019-06-08. Retrieved 2024-02-25.*

91. ^ *Sahin, Kaan (December 18, 2020). "The West, China, and AI surveillance". Atlantic Council. Archived from the original on February 26, 2024. Retrieved February 25, 2024.*

92. ^ *"Autocracy and AI Innovation". Stanford University Center on China's Economy and Institutions. Stanford University. July 1, 2022. Archived from the original on February 26, 2024. Retrieved February 25, 2024.*

93. ^ *"China's AI-Tocracy Quells Protests and Boosts AI Innovation". IEEE Spectrum. Archived from the original on 2024-02-26. Retrieved 2024-02-26.*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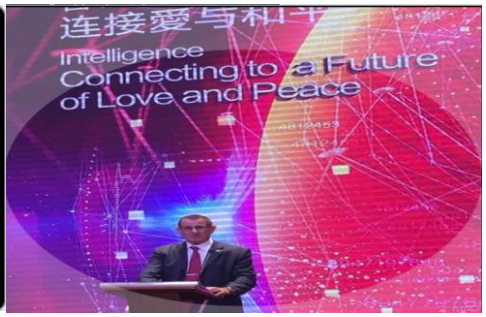
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