

# THE MAIN DIRECTIONS OF TECHNOLOGICAL COMPETITION BETWEEN THE UNITED STATES AND CHINA

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## **Abstract**

This article examines the technological competition between China and the United States of America and its impact on the international security system. Competition between the two countries in the field of artificial intelligence, 5G technologies, semiconductors, quantum computers and cyber security was discussed. The purpose of the research is to study the impact of technology on the system of modern international relations, to evaluate the role of innovative technologies in international security, and to analyze the expanding technological competition between China and the United States.

**Keywords:** Artificial intelligence, geopolitical and national security, superpowers, 5G technology, semiconductors, Quantum computers, cyber security.

The artificial intelligence (AI) competition between China and the United States is one of the most important technological rivalries of today. Both countries are investing heavily in AI research and development as they recognize the strategic importance of this technology in various fields. Both the United States and China have made significant progress in artificial intelligence research and development in recent years. The United States has been a leader in artificial intelligence for decades, with companies like Google, Microsoft, and IBM leading the way. However, China has emerged as a significant competitor in recent years, and China aims to become the world leader in artificial intelligence by 2030.

China's AI strategy is an important part of its plan to become a technological superpower. The country has invested heavily in AI research and development, and it has plans to develop several national AI programs. The Chinese government has also invested heavily in AI startups and research institutes. As a result, many Chinese corporations such as Baidu, Alibaba and Tencent have become important forces in the global AI industry<sup>1</sup>.

The artificial intelligence competition between China and the United States has significant implications for the global economy and national security. This competition can give one of the two countries a dominant position in various fields such as health, finance, transportation and defense. In addition, AI can have a significant impact on the labor market and cut many jobs in the future.

According to a McKinsey & Company report, artificial intelligence has the potential to create significant economic value of \$3.5 to \$5.8 trillion per year by 2025. If China or the US becomes a dominant player in artificial intelligence, it could have significant advantages in various fields and shape the direction of the global economy for decades to come.

Competition also has a major impact on national security. Both China and the United States see AI as important to national security and are investing heavily in it to gain a strategic advantage over the other. The use of artificial intelligence technologies for military purposes is worrisome, as this competition could lead to a new arms race between the two countries<sup>2</sup>.

However, according to some experts, the United States still has a significant advantage in the field of artificial intelligence. Patrick Moorhead, founder of Moor Insights & Strategy, noted in a Forbes article that “while China

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<sup>1</sup> "China's Rise as an AI R&D Superpower." Brookings Institution, 5 Sept. 2019, [www.brookings.edu/research/chinas-rise-as-an-ai-rd-superpower](http://www.brookings.edu/research/chinas-rise-as-an-ai-rd-superpower).

<sup>2</sup> Castro, Daniel. "The U.S. Must Act to Preserve Its AI Advantage Over China." Center for Data Innovation, 26 Oct. 2020, [www.datainnovation.org/2020/10/the-u-s-must-act-to-preserve-its-ai-advantage-over-china/](http://www.datainnovation.org/2020/10/the-u-s-must-act-to-preserve-its-ai-advantage-over-china/).

is making progress in AI, the United States remains the leader in research, talent and investment”<sup>3</sup>.

China and the United States continue to compete in technology, including 5G technology and semiconductor development. As the two superpowers seek to dominate these areas, the stakes are high, with potential economic, geopolitical and national security implications.

According to a report by Deloitte, China has a significant advantage in the competition for 5G dominance due to its large population, strong government support and heavy investment in research and development<sup>4</sup>. The report notes that China has more 5G base stations than any other country and its three major telecom operators have invested heavily in 5G infrastructure.

However, the United States is not far behind, with major telcos such as Verizon, AT&T, and T-Mobile rolling out 5G networks across the country. The US government has also taken steps to encourage the development of 5G technology, including releasing spectrum for 5G use and establishing a \$20 billion fund to support rural 5G deployment.

Despite these efforts, some experts believe that the United States is still lagging behind China in the race for 5G supremacy. Huawei CEO Guo Ping told CNBC that “the US is lagging behind in 5G deployment and China is winning the race”<sup>5</sup>. However, other experts say the race is far from over and the United States still has the potential to catch up and become a major player in the 5G industry.

Semiconductors are critical components of a wide variety of electronic devices, from smartphones and computers to automobiles and medical equipment. China and the United States are the main powerhouses in the

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<sup>3</sup> Moorhead, Patrick. "The U.S. Is Still the World Leader in Artificial Intelligence, But China Is Closing the Gap." Forbes, 7 Mar. 2021, [www.forbes.com/sites/patrickmoorhead/2021/03/07/the-us-is-still-the-world-leader-in-artificial-intelligence-but-china-is-closing-the-gap/](http://www.forbes.com/sites/patrickmoorhead/2021/03/07/the-us-is-still-the-world-leader-in-artificial-intelligence-but-china-is-closing-the-gap/).

<sup>4</sup> "The Race to 5G: Understanding the Global Impact of the Next Generation of Wireless Networks." Deloitte Insights, 2019, [www2.deloitte.com/us/en/insights/industry/technology/race-to-5g.html](http://www2.deloitte.com/us/en/insights/industry/technology/race-to-5g.html).

<sup>5</sup> "US and China in 5G: Who's Winning, Who's Losing, and Who's Ahead?" ZDNet, 22 June 2021, [www.zdnet.com/article/us-and-china-in-5g-whos-winning-whos-losing-and-whos-ahead/](http://www.zdnet.com/article/us-and-china-in-5g-whos-winning-whos-losing-and-whos-ahead/).

semiconductor industry. Today, China imports about \$300 billion worth of semiconductors annually<sup>6</sup>.

The Chinese government has pledged to invest \$1.4 trillion in the industry over the next decade in order to become self-sufficient in semiconductor manufacturing<sup>7</sup>.

The United States has a long history of semiconductor development, and today major US companies such as Intel, Qualcomm, and NVIDIA are among the main forces of the country's economy.

The US government is gradually taking steps to protect its semiconductor industry. Among other things, he introduced legislation aimed at establishing new semiconductor research institutes and increasing funding for semiconductor research and development. But some experts say the United States needs to do more if it wants to maintain its position as the world leader in semiconductor manufacturing.

Quantum computing is a breakthrough technology that has the potential to revolutionize many fields by providing unprecedented computing power and speed.

China and the US have created a fierce technological competition in quantum computing and cyber security. Both countries are investing heavily in research and development to outdo each other, and the results of this competition can have significant implications for national security, economic competitiveness, and global technological leadership. The US and China are investing heavily in quantum computing research and development, with China

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<sup>6</sup> "The Geopolitics of Semiconductors: How China Plans to Surpass the U.S." Foreign Affairs, 7 January 2021, [www.foreignaffairs.com/articles/united-states/2021-01-07/geopolitics-semiconductors](http://www.foreignaffairs.com/articles/united-states/2021-01-07/geopolitics-semiconductors).

<sup>7</sup> "China's \$1.4tn Plan to Overtake US in Tech." Financial Times, 8 March 2021, [www.ft.com/content/14d1c9a0-3ee2-46c6-a7e1-06ce1f7be54c](http://www.ft.com/content/14d1c9a0-3ee2-46c6-a7e1-06ce1f7be54c).

making significant progress in recent years<sup>8</sup>. In 2020, China introduced a new 64-qubit quantum computer, the most powerful quantum computer to date<sup>9</sup>.

However, the US is not far behind in the quantum computing race. In 2018, the US passed the National Quantum Initiative Act, which provides funding for quantum research and development and provides the framework for a national quantum strategy<sup>10</sup>. In 2020, IBM announced the development of a 27-qubit quantum computer, a milestone in the development of quantum computing<sup>11</sup>.

According to the official news agency "Xinhua", President of the People's Republic of China Xi Jinping emphasized the "strategic importance" of quantum technology in his speech to Chinese leaders in 2020. During this period, China put forward clear strategic ideas in quantum science. By some estimates, it is spending more on quantum research than any other country. In an April report, McKinsey & Company announced that Beijing has spent a total of \$15.3 billion on quantum research, more than four times the US investment of \$3.7 billion.

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<sup>8</sup> "Quantum Computing: China's Quest for Quantum Supremacy." The Diplomat, The Diplomat, 2 June 2021, [thediplomat.com/2021/06/quantum-computing-chinas-quest-for-quantum-supremacy/](https://thediplomat.com/2021/06/quantum-computing-chinas-quest-for-quantum-supremacy/).

<sup>9</sup> "China's Quest for Quantum Supremacy." Council on Foreign Relations, Council on Foreign Relations, [www.cfr.org/backgrounder/chinas-quest-quantum-supremacy](https://www.cfr.org/backgrounder/chinas-quest-quantum-supremacy).

<sup>10</sup> "National Quantum Initiative Act Signed into Law" - The White House (December 21, 2018) - <https://www.whitehouse.gov/briefings-statements/national-quantum-initiative-act-signed-law/>.

<sup>11</sup> "IBM unveils 27-qubit quantum computer" - ZDNet (September 19, 2020) - <https://www.zdnet.com/article/ibm-unveils-27-qubit-quantum-computer/>.

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