
Strategic Stability between China and the US in the Age of Artificial Intelligence

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Abstract

Artificial Intelligence (AI), an emerging dual-use technology, which holds the potential to change the nature of warfare, has the profound capability of reshaping the ongoing great power rivalry. From diplomatic engagements to traditional methods of warfare, AI may be leveraged to change the nature of warfare as well as redefine the concepts of strategic stability, deterrence, and balance of power. This paper argues that AI, in terms of its potential military applications, may dramatically affect the Beijing- Washington conflict and stability by aggravating strategic competition in new domains, including the nuanced multi-faceted and possible intersections with conventional weapons compromising nuclear deterrence. On one side, it argues that the potentials of militarized AI will keep continuous mistrust and ambiguity, which will increase the mutual strategic suspicion, and will significantly undermine the strategic stability between the two. On the other, it will also discuss the areas where AI may aid in ensuring stability and opens new avenues of cooperative engagements. Lastly, the paper briefly furnishes some measures to reduce the likely threat and instability.

Keywords

Artificial Intelligence, techno-rivalry, strategic stability, nuclear weapons, deterrence, escalation

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Currently humanity is witnessing an iconic revolution led by Artificial Intelligence (AI) and associated technologies like Quantum technology and the Internet of Things (IoT), amongst others enabling autonomy. AI is a critical element of what Klaus Schwab, head of the World Economic Forum, calls the Fourth Industrial Revolution. (Schwab, 2017) Beijing and Washington are increasingly integrating AI into their military systems in recent years. Both countries are investing heavily to merge AI-enhanced capabilities and enable machine-based decision processes with minimal human interaction. China's "New Generation Artificial Intelligence Development Plan" (新一代人工智能发展规划) and emphasis on "Military-Civil Fusion (MCF) indicates Chinese plans on integrating AI in its command-and-control structures, military training, wargaming simulations, and military intelligence to keep an edge in the future military warfare. (Chinese State Council 2017) DARPA (US Defense Advanced Research Projects Agency) had launched several AI-related projects like Gremlins, Commander's Virtual Staff, Life Learn Machine, etc., besides establishing the Algorithmic Warfare Cross-Functional Team (AWCFT) in 2017 to accelerate the US's advancement in the militarization of AI. (US Department of Defense, 2017). Many argue that the world has already entered a new form of arms race, i.e., for AI. Elon Musk, the head of Tesla and SpaceX, has even said that growth in artificial intelligence technology, left

unchecked, could risk sparking World War III. (Hern, 2017)

Experts in the US argue that the Chinese developments in AI will significantly threaten the USA's leadership in technology as well as liberal-international order

Many experts in the US fear that China will soon narrow the gap in current technological capability between the US and China. They argue that the Chinese developments in AI will significantly threaten the USA's leadership in technology as well as liberal-international order. (Kania, 2018) Some scholars even claimed that a "technology Cold War" is in full swing in the most advanced industries of the world (Zhong and Mozur, 2018). Also, Kaifu Lee, an AI scientist and current CEO of Sinovation Ventures, has said the rapid development of AI in China and the US could give rise to new world order (Lee, 2018). More commonly known is what Putin said, the country that dominates AI will become the ruler of the future world (Vincent, 2017). In light of such heightened competition for AI, this paper aims to highlight the possibilities at the intersection of military applications of AI and future strategic impact and threat to Sino-US strategic conflict.

Conceptualizing Strategic Stability

The concept of strategic stability took shape during the cold war rivalry between the superpowers. It was defined as an equilibrium of strategic forces between the USA and USSR in terms of mutual deterrence. Its basic logic was to stabilize the bipolar confrontation by ensuring that each side could strike back effectively even after an attempted disarming the first strike by its opponent. (Colby, 2013) In such a situation, neither side was motivated to launch the first strike , establishing stability between the two nuclear-armed states. In the post-cold war era, many contested that the concept no longer found ground in the international order as the USA remains the world's sole leader.

The extent to which AI may impact the strategic stability between China and the US depends on the openness of the strategic stability environment between both countries in particular, and in the world in general

Increasing strategic competition and rivalry between the US and China is aggravating the ‘not-so-over’ cold war mentality between the two and making the older concept of strategic stability a concern yet again. The US DoD (Department of Defense), in its 2018 National Defense Strategy, reveals that the USA will continue to develop AI applications, to

maintain its military superiority. The theories of Thucydides Trap further validate disturbing stability in an international environment. (Allison, 2015) It states that the conflict between a rising power and an established power is inevitable. The mutual suspicion, highlighted by the prolonged trade war between the two, will lead to a ‘Security Dilemma’ in an anarchic system. In such a hostile environment, strategic stability is likely to be under threat.

The extent to which AI may impact the strategic stability between China and the US depends on the openness of the strategic stability environment between both countries in particular, and in the world in general. To be more specific, it will be determined by how a particular state conceptualizes or incorporate AI in its military applications. Therefore, the perception as well as capability of competing actors will be determining factors in strategic stability.

Conceptualizing AI

The profusion of various forms of AI and the complexities around its applications have made it challenging to categorize it. AI comprises a host of technologies, processes, and methods that can be differentiated from one another based on their applications. In simple terms, AI is an enabler that makes machines work with human capability or exhibit human characteristics. Before we move forward to

study the impact of AI on stability, we look into the military applications which cause risks and threatens stability.

There are two possible ways in which AI can be leveraged to generate military advantage. Either by integrating within existing doctrines and battle concepts or improving the speed of action and effectiveness of the human environment. Another way of classifying AI is based on the role it can play. In its analytical role, AI will provide situational awareness and actionable intelligence to decision-makers. In predictive roles, it may significantly transform the tactical, operational, and strategic domains of military operations. At the operational level, AI, robotics, and automation may take over various dull, dirty, and dangerous tasks. AI as Lethal Autonomous Weapons System (LAWS) in the form of swarms, autonomous drones, or autonomous underwater vehicles, will lead to the development of offensive military capabilities. (Burton & Soare, 2019)

The potential applications of AI in enhancing the strength of the cognitive domain in warfare will increase the chances of mutual suspicion and misunderstandings

In terms of strategic implications, the following major areas can be found:

- (a) AI will not exist in a vacuum or in isolation to act as a strategic game-

changer. It is conceptualized to reinforce the destabilizing capabilities of the existing weaponry. It will accelerate the dispersion and concentration of force, increase the lethality, precision, and destructiveness of the application of military power. It will thereby give offensive operations an advantage, which will undermine an adversary's ability to defend itself.

- (b) The potential applications of AI in enhancing the strength of the cognitive domain in warfare will increase the chances of mutual suspicion and misunderstandings.
- (c) The operational and strategic advantage offered by AI will make nuclear-armed rivals more assertive and ambiguous in their quest for technological superiority. If the use of AI as a stand-alone capability is conceived by nuclear actors, it could undermine, disrupt, and destroy enemy systems through computer network-enabled operations.
- (d) Immaturely developed AI may have catastrophic effects if the competitors rush to advance their current nuclear capabilities with unsafe and unverified technology, causing a threat to nuclear security. (Johnson, 2019)

Ai Threatening US-China Strategic Stability

The foundation of strategic deterrence can be significantly damaged with the disruptive

consequences of AI-enabled weapons. Conflicts involving China and the United States are possible in Taiwan and the South China Sea, and AI weapon systems' employment may worsen these situations. As a part of its operational investigation in 2016, the US Naval forces used unmanned underwater vehicles (UUV) to carry investigations in the South China Sea. (Cronk, 2016) This incident was dragged as a diplomatic issue between Washington and Beijing when China's Naval Patrol forces captured it. A state can advance its political and diplomatic influence with the help of the more advanced form of technology and thereby, can accelerate the crisis.

In general, an AI superiority may shift the offense-defense balance more towards the offensive side, wherein the incentives to undertake offense may be better and more profitable

In 2014, the Department of Defense released its 'Third Offset Strategy,' the aim of which, as described in 2016 by then-Deputy Secretary of Defense, "is to exploit all advances in artificial intelligence and autonomy and insert them into DoD's battle networks. (Pellerin, 2016) The Advanced Targeting and Lethality Automated System (ATLAS) program of DARPA clearly says that "it will use artificial intelligence and machine learning to give ground-combat vehicles autonomous target capabilities." (Gronlund, 2019) China's emphasis on

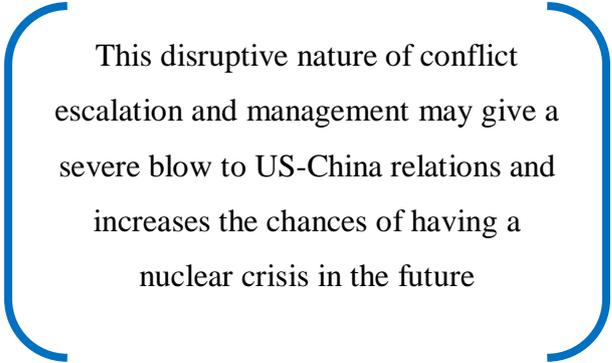
informatization, intelligentization, and future use of unmanned swarms in its military modernization plan brings it in an extremely competitive environment with the US. This may have serious implications on their offense-defense strategies. In general, an AI superiority may shift the offense-defense balance more towards the offensive side, wherein the incentives to undertake offense may be better and more profitable. Countries may have fewer incentives not to attack pre-emptively when having a technological edge over their adversary.

Moreover, the unmanned weapons and conflicts are less regarded with public sentiments and lead to reduced public sentiments against wars and hence, reduced the threshold for going to the war. AI, thus, offers motivations to the actors involved to go to war. The fear of misjudgments and operational faults will increase the chance that conflict will become more likely and needed. The future development in AI and the risks of the absence of human cognition in decision making will further aggravate the threats related to escalation dynamics and actual warfare.

Coming to the nuclear stability factor, stability for the nuclear states means the ability of a second strike. Both actors' ability to safeguard their second-strike capability from a pre-emptive attack can be undermined once they both have high end disruptive and advanced capability AI weapons. Recent developments

made in sensor-based technologies, machine learning, and quantum technology may make it possible for one to identify and destroy the second-strike capability of the adversary. The retaliatory weapons like mobile missile systems and submarines can easily become vulnerable to newer technologies' advanced capabilities. The use of sophisticated AI-enabled Air weapon systems and their proliferation will make their use more likely. The collaborative use of quantum technologies and AI will unbelievably change the way unmanned swarms can target complicated missions. For instance, in a conflict situation, offensive use of unmanned airborne systems by a stronger nuclear-armed state against a weaker nuclear-armed state will create pressure on the latter to react with nuclear use in a 'use-them-or-lose-them' situation. The low-cost and some low-risk AI-augmented manned and unmanned systems, without regulated paths and legal framework, will promote asymmetric warfare and enable states to erode the deterrence capabilities of their adversaries. This disruptive nature of conflict escalation and management may give a severe blow to US-China relations and increases the chances of having a nuclear crisis in the future. Moreover, Rand Corporation's Report on AI and Nuclear wars published in 2018 predicts that AI may trigger a nuclear war by 2040. (Giest and Lohn, 2018) Some scholars also believe that the destabilizing impact in such an environment may encourage some nuclear states to renounce their No First Use Policy, further eroding the

concept of nuclear stability. (SIPRI Report, 2019) If China does so, it may have vital consequences for stability between China and the US.



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Stability Enhancing Effects of AI

Historically speaking, technological developments have brought stability as well as new areas of cooperation for states. Realist scholars like Waltz believed that nuclear presence had prevented the cold war from turning into a full-fledged armed conflict. AI also calls for cooperation, promoting global governance, and opens the scope for bringing stability between major powers. First, faster and more reliable ISR capabilities and early warning systems will improve the decision-making process. Second, the preventive capabilities across domains like cyber and nuclear will be strengthened with AI and can be used in nuclear safety and maintenance. This way, machines can reduce failures due to human error. Third, AI will greatly enhance the development of stronger weaponry systems, including supersonic, hypersonic, and unmanned vehicles. It will not only enhance

the defense capability of militaries but also increase the deterrence capability to better equip themselves before the crisis. Fourth, the applications of AI in wargaming simulations can also be used to improve the prediction mechanism and enable better decision-making. SIGNAL, a wargame developed by researchers at the University of California, explores how different weapons capabilities can affect the behavior of different actors in an escalating conflict situation. Similar systems can be developed to learn how conflicts can be deescalated and better handled to cause minimum losses. Fifth, AI can significantly enhance the monitoring and verification system for ISR, early warning, etc., to improve state compliance related to arms control and disarmament. Nuclear Threat Initiative (NTI), a US-based think-tank, is exploring how machine learning can be used to gather, organize, and use open-source data to supplement the traditional monitoring and verification of non-proliferation regimes.

More generally speaking, various applications of machine learning and AI can make assurance and deterrence more reliable. In times of crisis, assurance to strategic allies would be easier as they can also be provided with comprehensive intelligence. This would require the state to reduce its nuclear arsenal, thereby reassuring the potential adversary and ultimately reducing the risks of war.

Mitigating Measures

The UN has recognized AI as a new frontier and has emphasized the need to bring regulations for AI's ethical use. Being designated as the key participant in the newly opened global dialogue on AI, UNESCO aims to ensure humane use of AI. Another UN platform - The AI for Good Global Summit works towards global and inclusive dialogue on AI. The UN Convention on Certain Conventional Weapons has also become a forum for discussing questions about the emergence of lethal autonomous weapons systems (LAWS). However, beyond this, practical solutions need to come out from actors, especially those who are hurriedly involved in AI militarization. To reduce the emerging threats, bilateral and multilateral agreements, confidence-building measures (CBMs), etc., should be in place to build trust among parties, support crisis prevention, and facilitate crisis mitigation. Like traditional agreements, countries may agree on (a) the types (or number) of systems that they should or should not develop, acquire and use, or (b) how they should or should not use the technology. Newer debates on international regulatory regimes should incorporate new hard and soft laws. Hard law can be a legally binding international treaty to ban a certain technical capability (Saalman, 2019), and soft law may make up a political declaration or international code of conduct to encourage best practices or provide guidance to states,

academia, or industry regarding the appropriate or safe use of technology. One of the vital subjects to gain consensus is that humans should remain in the loop. Second, the Early Warning System should be kept separate from Command-and-control systems for a nuclear launch. In the operationalization of such systems, humans should remain the ultimate interpreter of information and should only authorize the nuclear launch. Third, both US and China should disclose general information on the development of military technology. China, in this case, needs to come out as a more transparent actor to reduce hype and suspension from the US's side. Moreover, they should promote avenues of scientific cooperation, including AI safety and crisis management in AI applications. One difficult step would be to ensure military-to-military cooperation to reduce tensions and heightened perceptions. Finally, both should agree on concrete technical, organizational, and policy measures that could reduce the negative impact of AI on strategic stability and nuclear risk.

Conclusion

Clausewitz has earlier noted that the unseen complexities involved in military affairs do not allow for clear answers. (Otte, 2002) However, for now, it can be said, that the increased speed, lethality, and enhanced ranges will walk up the escalation rungs, and crossing the military thresholds will take the conflicts to the strategic level. Fears on the pessimistic side of

the instability-stability ledger include the multi-faceted possible intersections of AI with nuclear weapons; rapid technological diffusion, and military AI advancements. Further, its naturally destabilizing effects, especially heightened speed and vulnerability; and the interplay of these intersections with strategic nuclear and non-nuclear capabilities, could create an unstable situation. Though AI offers opportunities to develop healthy systems, the challenge will be to manage the concerns related to ethics and privacy and the individual and competitive capacities of individual countries to acquire AI weapons. One can expect that militaries will also emphasize leveraging AI on minimize dangers and ensure security as much as they focus on offensive use. Thus, while the militarization of AI will continue to be a feature in future military modernization, it will be harnessed to ensure security as well as to destroy it.

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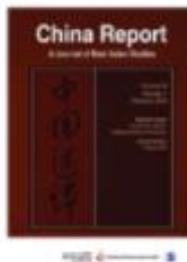
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