Centre for International
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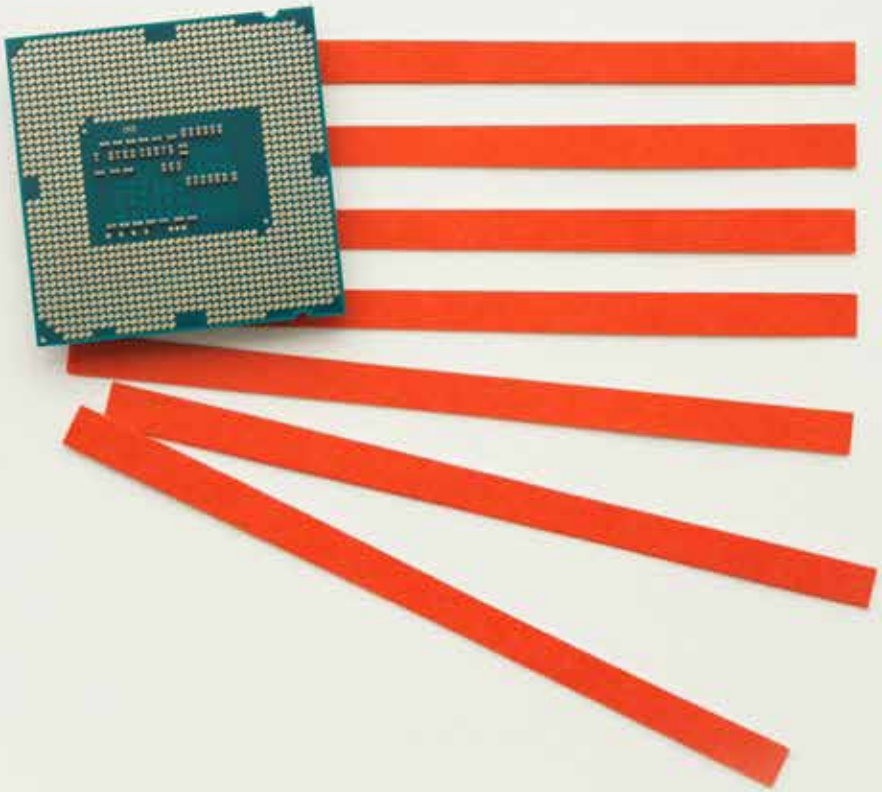
United States-China Multilateralism in the Age of Military AI

Daniel Araya and Alex He



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Daniel is a regular contributor to various media outlets and organizations such as *Forbes*, the Brookings Institution, Futurism and Singularity Hub. He has been invited to speak at a number of universities and research centres, including the US Naval Postgraduate School; Harvard University; the American Enterprise Institute; the Center for Global Policy Solutions; Stanford University; the University of Toronto; the University of California, Santa Cruz; and Microsoft Research. His most recent books include *Augmented Intelligence: Smart Systems and the Future of Work and Learning* (2018) and *Smart Cities as Democratic Ecologies* (2015). Daniel has a doctorate from the University of Illinois at Urbana-Champaign.

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Acronyms and Abbreviations

AI	artificial intelligence
AR	augmented reality
C2	command and control
C4	command, control, communications, computers
CNN	convolutional neural network
CPC	Communist Party of China
CSET	Center for Security and Emerging Technology
ISR	intelligence, surveillance and reconnaissance
JADC2	joint all-domain command and control
LAWS	lethal autonomous weapons systems
MCF	military-civil fusion
MDPW	multi-domain precision warfare
OODA	observe, orient, decide, act
PLA	People's Liberation Army
R&D	research and development
REAIM	responsible military use of artificial intelligence and autonomy
UAVs	unmanned aerial vehicles
UCAVs	unmanned combat aerial vehicles
VR	virtual reality

Executive Summary

This paper examines the shifting global power dynamics driven by the rise of China and the rapid advancements in artificial intelligence (AI). Taken together, a rising tide of high-tech weapons development and a return to great power rivalry are setting the conditions for a tectonic shift in the global security landscape. The paper highlights the strategic challenges posed by these trends and underscores the critical need for multilateral cooperation in managing a new multipolar world order. It calls for strengthened diplomatic and military frameworks to mitigate risks, drawing on historical precedents in arms control to guide future governance of AI in military applications.

Introduction

A seismic shift in the nature of global governance is setting the conditions for changes in the international security environment. Taken together, the rise of China and the emergence of military technologies linked to AI and robotics are setting the stage for a new multipolar era. Accelerating this shift is a new global balance of power. As the primary drivers of research and development (R&D) on AI and robotics, the United States and China now stand at the forefront of technological discovery. Indeed, the return of great power rivalry and the integration of "machine intelligence" into military systems and planning reflect the emergence of a new global order.

The widespread adoption of AI and robotics into military affairs is not without historical precedent, but the capacities of AI to independently learn from data represent a force multiplier with a unique potential to reshape the "commanding heights" of the global economy (Yergin and Stanislaw 1998). Coupled with the mounting challenge of geopolitical fragmentation, AI has the potential to outpace the capacities of existing institutions of multilateral governance (National Intelligence Council 2021).

This paper explores the strategic challenges associated with these trends and the need for multilateral engagement in navigating a changing global order. The paper examines the dangers of unchecked technological proliferation and the need for regulatory oversight in reducing the risk of military conflict. Building on a history of diplomatic engagement, new bilateral and multilateral agreements will be critical to managing the competition for military AI.

The paper is structured as follows: the first three sections examine the dangers of great power rivalry across a multipolar system, with a particular focus on US-led efforts to regulate military AI. This is followed by an exploration of the evolution of US military defence and security planning in light of the military applications of AI. The fifth and sixth sections examine China's expanding military capacity and its strategic approach to AI weaponization, respectively. This is followed by discussions on the need for global governance of military AI with a particular emphasis on China's approach to global governance. Finally, the last section concludes with policy recommendations supporting US and Chinese dialogue on military defence and security.

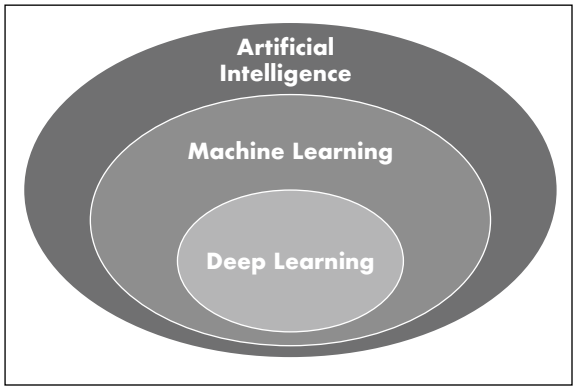
Understanding Military AI

As an engine of economic development, data-driven technologies overlap a new global balance of power with enormous implications for the future of military competition. The advent of deep learning algorithms, especially convolutional neural networks (CNNs), has unlocked new computational tools in the pursuit of new weapons technologies. These tools include applications linked to autonomous vehicles and robotics, intelligence analysis and decision-support systems, and cyber defence and security.

As nations race to develop and deploy military AI, concerns about great power conflict and the weaponization of algorithmic technologies loom large. Like the bipolar frictions of the Cold War, the current global order is framed by advances in technological discovery. However, unlike the Cold War period, the twenty-first century international system has become deeply fragmented. Balancing technological discovery with international security cooperation will be key to managing the accelerating risk of geopolitical crisis.

The explosion of interest in AI has gathered pace over the past decade as improvements in machine learning and computational processing power have converged. As a subset of AI, machine learning uses statistical methods to enable machines to learn without explicit instruction (see Figure 1). In fact, machine learning or "deep learning" algorithms encompass a broad range of data-driven techniques that enable software to perform tasks that mirror and even outperform human capabilities.

Figure 1: The Layers of AI



Source: Authors.

The precise definition of AI remains a moving target, but conventional descriptions of AI understand the technology in terms of software that amplifies human intelligence. In broad terms, AI is a "general-purpose technology" with the capacity to reconfigure the scale and scope of existing military systems (Bresnahan and Trajtenberg 1995; Kania 2017). Much as mass electrification catalyzed the rise of modern industrial weapons in the twentieth century, weapons systems derived from AI and robotics are expected to transform the contours of conflict and war in the twenty-first century (Scharre 2018; National Intelligence Council 2021).

Forecasting trends in military technologies is a daunting challenge because timelines on the development of AI remain unclear. Military AI could end up being less important to future military planning than current projections suggest. Alternatively, AI technologies could revolutionize military affairs in completely new ways. What does seem clear is that deepening fault lines across a fragmented global order portend increasing global instability. More to the point, geopolitical tensions linked to the decline of US hegemony and the rise of military AI can be expected to heighten the potential for military confrontation.

Military AI in a Multipolar World

The fusion of conventional weapons technology with AI and robotics is now driving the evolution of a new era in "smart weapons" systems (Defense Advanced Research Projects Agency 2020). Spanning autonomous weapons, intelligence analysis and decision support, AI is becoming increasingly capable of driving machine autonomy across a range of military systems and processes. AI-augmented automation is expected to replace a range of repetitive tasks, freeing personnel to take on more complex and demanding activities.

Notwithstanding the fact that technological dominance has been a key pillar of US military hegemony, other nations are quickly catching up. According to a new report by the World Intellectual Property Organization (2024), China now leads the world in generative AI patent applications. In fact, China has filed more than six times the number of patent applications than that filed by the United States. China's technology sector is now reaching a critical mass of expertise, talent and capital that is realigning the commanding heights of the global economy.

Beyond the era of Western predominance, the global order is becoming multipolar. Understanding the competitive dynamics across this new multipolar system is critical to building the necessary guardrails for navigating a new technological era. The relative decline of US influence and the growing importance of regional powers (such as Brazil, India, Iran, Russia, Saudi Arabia and Türkiye) suggest that power and influence are becoming more broadly diffused. As journalist Fareed Zakaria (2012) observes, the global order has become "post-American."

While the United States has established a strong lead in AI discovery, it is increasingly likely that China may dominate the industrial application of AI systems. Growing rivalry between the United States and China elides with a shift in the world's economic centre of gravity. Indeed, frictions in

the US-China relationship are likely to become permanent features of a new geopolitical landscape (Mearsheimer 2014; Horowitz and Scharre 2021).

The risk of protracted military competition across a vastly more complex multipolar system raises the spectre of enormous geopolitical instability. Asia's return to the centre of world trade is catalyzing deep structural changes in the global economy (Khanna 2019). The region's extensive trade networks, facilitated by international agreements such as the Association of Southeast Asian Nations Free Trade Area and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, are setting the conditions for a new global balance of power (Romei and Reed 2019).

Toward Multilateral Engagement

The challenge of multipolarity means that states of various sizes and capacities can be expected to leverage AI to vigorously compete for influence. The proliferation and diffusion of military technologies that build on AI will make conventional military assets vulnerable while heightening the risk of escalation (National Intelligence Council 2021). Beyond the United States and China, an increasing number of states can be expected to develop and procure AI-driven weapons systems (Ashford and Cooper 2023). As nation-states seek to leverage AI to compete for influence, changes in the global order can be expected to remain unpredictable.

Multilateral engagement across a fragmented global system will be critical to avoiding permanent crisis. Indeed, AI represents both a strategic opportunity and a destabilizing risk in setting the conditions for a complex multipolar order. Safeguarding the ethical development of AI and the management of new risks associated with lethal autonomous weapons systems (LAWS) is critical to navigating this new stage of history.

Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy

Even as the most advanced states in the global system continue to push the boundaries of AI, nations can be expected to compete in the development and advancement of military applications (Brose 2019). Without formal agreements on the use of military AI, competition to dominate the technology will almost certainly lead to wider instability.

Thus far, no nation has provided a coherent policy architecture for governing AI on the battlefield. Given the risk of mass proliferation, multilateral engagement will be fundamental to regulating AI across an increasingly fractured international system. Advancing comprehensive diplomatic and security agreements between the world's most technologically advanced nations could be foundational to avoiding great power conflict. Indeed, dialogue between the world's most powerful states could set the conditions for shared international norms.

The dangers of pervasive legal ambiguity in governing military AI could mean decreasing opportunities for multilateral coordination. In the United States, recent declarations on military AI, such as The White House's Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence (2023) and the US Department of Defense's Data, Analytics, and Artificial Intelligence Adoption Strategy (2023), offer some value in encouraging dialogue on global governance.

The recent Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy (hereafter referred to as the Political Declaration on REAIM)[1] introduced by the United States signals an important first step in regulating the use and application of military AI. Announced at the Summit on Responsible Artificial Intelligence in the Military Domain and co-hosted at the Hague by the Netherlands and the Republic of Korea, the United States' proposed declaration serves as an important resource for promoting the responsible and accountable use of AI in the military domain.

1 See www.state.gov/political-declaration-on-responsible-military-use-of-artificial-intelligence-and-autonomy/.

With the goal of promoting transparency in the use of military AI and minimizing the risks of unintended escalation or harm, the declaration provides a framework for ensuring that AI technologies are developed and utilized in a manner consistent with international law and humanitarian principles. Emphasizing the importance of multilateral consensus and transparent practices in the use of autonomous weapons systems, the declaration underscores the importance of maintaining human control over AI.

In the current environment, diplomatic cooperation between the most powerful states in the system has largely become impossible. Notwithstanding ongoing divisions within the global system, the Political Declaration on REAIM provides some measure of hope for slowing ongoing fragmentation. Indeed, given the range of challenges we now face, multilateral cooperation will be key to managing growing instability.

Although China is not a signatory to the current US declaration, China did endorse the REAIM 2023 Call to Action[2] and remains actively engaged in discussions on the weaponization of AI (Marijan 2023; Government of the Netherlands 2023). In fact, US-China cooperation has undergone periods of engagement in the past, including joint military exercises and training reflecting economic and geopolitical reciprocity. When cooperation has occurred, it has typically involved dialogue and exchange on issues of mutual concern — for example, regional security, maritime navigation and counterterrorism.

During the Cold War, the United States and the Soviet Union engaged in arms control agreements across a range of weapons technologies, including strategic missile defence, intermediate-range missiles, space-based weapons and biological weapons. Much as it did then, the application of AI and robotics to defence and security signals the need for a new generation of regulatory arms controls. By mobilizing a broad group of stakeholders and fostering collaboration, the Political Declaration on REAIM could offer a means to framing the strategic engagement needed to rebuild global cooperation.

Beyond the declaration alone, multilateral agreements are necessary to erect the legal and ethical obligations needed to manage the fissures within the international system. Given the need for sustained dialogue on AI, the world's most technologically advanced nations will need to navigate shared economic, geopolitical and security challenges. In addition to AI and robotics, future advances in quantum computing and biotechnology can be expected to drive new waves of existential risk in reshaping the global security landscape.

The Evolution of US Military Defence and Security

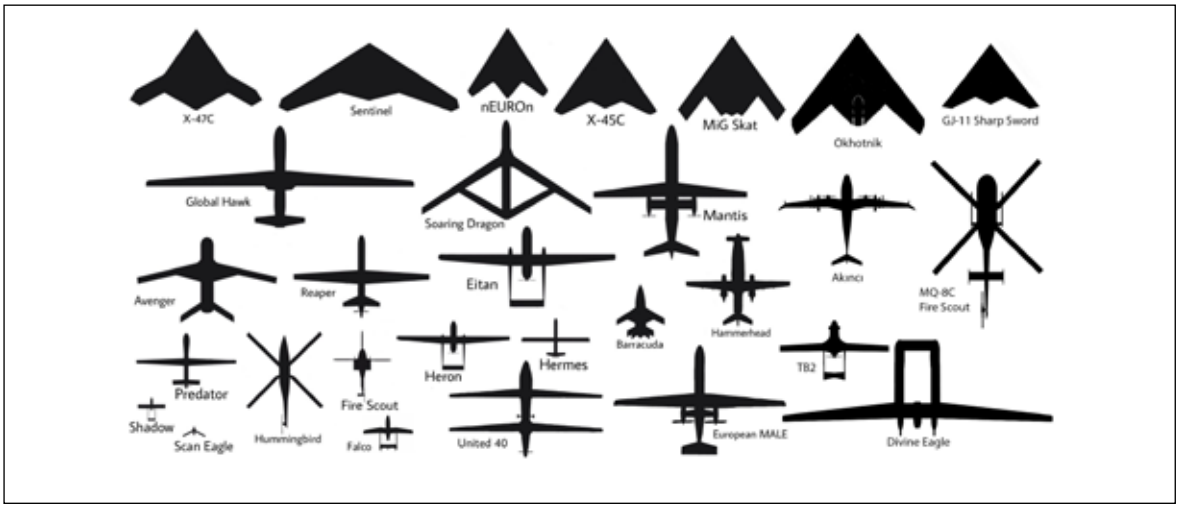
Conventional forecasts on military AI and robotics often make the common error of assuming that disruptive technologies simply replace older technologies on a one-to-one basis. The reality is that general-purpose technologies tend to disproportionately replace older systems with dramatically new architectures, boundaries and capabilities. Building on general-purpose technologies of the past — the steam engine, the printing press, the internal combustion engine and the internet — AI can be expected to catalyze deep changes in the fabric of the global system.

In response to this changing security landscape, the US Department of Defense has begun formulating specific guidelines and regulations to manage the transition to an era of "augmented warfare" (Center for Strategic and International Studies 2024). These measures include the establishment a Joint Artificial Intelligence Center with the purpose of developing ethical guidelines on the use of military AI. More broadly, the Department of Defense has begun the process of developing policies and protocols for mandating transparency, accountability and compliance in the development and deployment of AI and robotics, including the importance of human oversight by keeping humans "in the loop."

The ongoing proliferation of AI technologies, such as drones, robotics and autonomous machines, reflects a new arms race in algorithmic weapons systems (see Figure 2). Algorithmic technologies that build on machine learning are becoming ubiquitous, omnipresent and transformational

2 See Government of the Netherlands (2023).

Figure 2: Comparing Drone Platforms



Source: https://en.wikipedia.org/wiki/List_of_unmanned_aerial_vehicles#/media/File:UAV_Comparison.jpg.

across multiple military and civilian fields. Taken together, autonomous drone swarms, satellite-mediated communications and human-machine teaming represent disruptive forces in remaking the scale and scope of military conflict.

Applications of AI in the US Military

The integration of AI and robotics into military planning has important implications for the future of the US military (Scharre 2019). AI systems can process vast amounts of data quickly and accurately, providing commanders with real-time insights and predictive analytics. In addition to warfighting, AI is becoming increasingly important to logistics, equipment maintenance and medical support, streamlining operations and reducing the burden on personnel. AI algorithms can already predict when equipment will need repairs, optimizing maintenance schedules and minimizing downtime. Moreover, autonomous drones have been used for both reconnaissance and supply for many decades.

Some notable applications of military AI include:

→ **Intelligence, surveillance and reconnaissance (ISR)**

- Automated data analysis: AI systems can analyze vast amounts of data from various sources, including satellites, drones and sensors, to provide actionable intelligence.
- Pattern recognition: AI identifies patterns and anomalies in data that might indicate potential threats or targets.
- Predictive analysis: AI models predict enemy movements and intentions based on historical data and current intelligence.

→ **Autonomous vehicles and drones**

- Drones and unmanned vehicles: AI can control autonomous drones and vehicles for reconnaissance, logistics and even combat operations.
- Robotics: AI-driven robots can perform tasks such as bomb disposal, surveillance and battlefield support.
- Swarm technology: AI can coordinate multiple autonomous systems to operate as a cohesive unit, enhancing efficiency and effectiveness.

→ **Cyber defence and security**

- Threat detection and response: AI systems can detect and respond to cyberthreats in real time, identifying vulnerabilities and mitigating attacks.

- Offensive cyber operations: AI can assist in planning and executing cyberattacks against an adversary's critical infrastructure and communication networks.

→ **Strategic planning and analysis**

- Scenario analysis: AI can evaluate various strategic scenarios and their potential outcomes to assist in long-term planning.
- Risk assessment: AI can assess risks and vulnerabilities in military operations and strategic plans, providing insights to mitigate potential threats.

→ **Simulation and training**

- Virtual reality (VR) and augmented reality (AR): AI can enhance VR and AR training environments for realistic and immersive training experiences.
- Adaptive learning systems: AI can tailor training programs to individual needs, improving learning efficiency and effectiveness.

→ **Predictive maintenance:** AI and data-driven systems can provide tools for predictive maintenance support, ensuring that military equipment and machinery (such as aircraft, vehicles and weapons systems) are maintained at peak capacity. By analyzing sensor data and historical maintenance records, AI algorithms can predict equipment failure before it occurs, optimizing maintenance schedules and extending the lifespan of military resources.

→ **Logistics and supply chain management:** AI is increasingly being leveraged to optimize logistics and supply chain management across the US defence sector. AI algorithms optimize transportation routes, inventory management and resource allocation networks in order to ensure the timely delivery of supplies and equipment to military personnel around the world.

Even as AI systems accelerate the pace of decision making, AI and autonomous robotics have begun to provoke discussions on changes to US military planning (National Intelligence Council 2021). While AI and robotics are expected to revolutionize military operations, they also raise concerns about the ethical implications of autonomous decision making in warfare, and the need for robust security measures to prevent adversarial misuse. Ultimately, the move to AI and robotics marks a significant evolution in how the US military maintains its global security architecture.

Notwithstanding the fact that the new technologies inherently enhance conventional military capabilities, the proliferation of high-speed smart weapons calls into question the longevity of expensive and difficult-to-replace platforms and weapons systems within the US military. Taken together, autonomous robots, hypersonic munitions and AI-powered cyber defence systems can be expected to become integral components of long-term military planning (ibid.).

China's Military: Mission, Goals, Strategy

China has the world's largest military.[3] Notwithstanding its size, however, the strategic goal of the People's Liberation Army (PLA) is to improve and modernize its military, becoming "world-class" by the middle of this century. With the stated goal of achieving complete national defense and military modernization by 2035, China's military planners have invested significant resources in modernizing the PLA in line with militaries in advanced economies.

China's military modernization strategy was first articulated in October 2017 at the 19th Congress of the Communist Party of China (CPC). This was followed by a 2019 white paper, titled "China's national defense in the new era," and then later updated in the 2022 report for the CPC's 20th Congress (State Council Information Office 2019). The stated ambition of the PLA is not to develop the world's single most powerful military, but rather to rank *among* the world's leading militaries (Theoretical Learning Center Group of the Party Committee of National Defense University 2018; Fravel 2020).

China's military ambitions are largely driven by a strong and consistent sense of insecurity. Indignity and despair linked to a "century of

3 See https://worldpopulationreview.com/country-rankings/military-size-by-country.

humiliation" has reinforced a frenetic drive to advance the country's military capabilities. Driven, in part, by trepidation over falling behind the militaries of industrialized nations — most notably the US military — the PLA leadership worries that it could fail to safeguard the country's sovereignty, security and overall development.

Consequently, China's rapidly expanding defence capacities are justified by a principle of self-defence. This is despite the country's aggressive posture toward Taiwan and ongoing disputes in the South China Sea and East China Sea. In fact, the CPC views these regional disputes through the lens of national sovereignty. Beijing understands its military posture on these issues as defending the nation's territorial integrity in response to foreign adversaries (State Council Information Office 2015, 2019).

Astonished by the US military's advanced technology capabilities as demonstrated in the first Gulf War (1991), the PLA has focused on shrinking its technological gap with the US military. In response, the military strategy that it released in 1993 featured preparation for winning local wars in conditions of high technology (State Council Information Office 2015). China's military strategy was further modified in 2004 in preparation for winning "information wars" with the rise of the internet.

Along with its modernization strategy in response to America's predominance in military technologies, China's military planners have focused on an asymmetric strategy in order to better leverage the country's limited technological resources. Although not the PLA's strategy, the idea of unrestricted warfare was first proposed in 1999 by two colonels in the PLA air force. It includes integrating financial, trade, ecological, cyber, cultural, political, diplomatic, terrorist, drug and ideological measures as a means to defeat an opponent (Qiao and Wang 1999).

China has two parallel military strategies at work. One strategy is focused on mainstream military modernization to catch up in advanced technologies, while a second strategy is focused on asymmetric leverage to cope with challenges that cannot be overcome anytime soon. This includes investments in anti-satellite weapons, anti-ship ballistic missiles, space-based technologies and submarine production as a means to cope with America's military dominance.

"China's national defense in the new era," released in 2019, introduced a focus on AI and "intelligent warfare" while continuing to build on a methodology of "informatized" warfare. This includes a focus on integrating and accelerating the development of an intelligent military (State Council Information Office 2019). In fact, President Xi Jinping raised this goal at the CPC's Politburo collective study session in July 2020 (The Central People's Government of the People's Republic of China 2020). This strategy of mechanization, informatization and intelligentization was written into China's outline for the country's latest 14th Five-Year Plan (2021–2025) and Vision 2035, becoming the country's top strategy for military development (The Central People's Government of the People's Republic of China 2021).

The PLA, its defense industry and its research institutions have invested heavily in research and applications of AI in weapons and combat systems. With an emphasis on unmanned intelligent combat systems, such as unmanned aerial vehicles (UAVs), unmanned underwater vehicles, ISR, training, simulation and wargaming, and augmented military decision making (Kania 2020; Zhang 2020), AI is becoming fundamental to China's military modernization. At the same time, information and cyberwarfare, in particular emerging AI-based intelligent warfare, has been considered as a new means of asymmetric warfare in China's military.

The military-civil fusion (MCF) strategy is expected to play a critical role in technological breakthroughs supporting the Chinese military, including the AI applications in the military. President Xi first proposed upgrading MCF to a national development strategy in 2015 (Xinhua News Agency 2015). MCF was institutionalized in 2017 (The Central People's Government of the People's Republic of China 2017) and officially upgraded to China's national strategy in the CPC's 19th Congress that same year (The Central People's Government of the People's Republic of China 2018). MCF is aimed at promoting deeper integration between China's military-industrial complex and its vast commercial enterprises through infrastructure building, the sharing of resources and talent development, as well as weapons and equipment procurement for defence purposes (Jin 2018).

Reading between the lines, the party's documents and official publications on the MCF strategy reflect an interest in advancing military capabilities through civilian enterprise and

research institutions. In terms of the scope of the MCF strategy, space, oceans, cyberspace, biology, new energy, AI and quantum technology are listed as the priority fields (The Central People's Government of the People's Republic of China 2021).

Over the past decade, companies such as Huawei, Baidu, Alibaba, Tencent, DJI, SenseTime and Combricon have become industry-leading companies in 5G, the Internet of Things, AI and AI-related facial recognition, as well as big data, smart cities, data centres and cloud computing (He 2022). Under these circumstances, private high-tech companies are becoming the main sources of China's military and defence procurement.

A study by the Center for Security and Emerging Technology (CSET) showed, not surprisingly, that private companies account for 61 percent of the total 273 suppliers to the PLA (Fedasiuk, Melot and Murphy 2021). Despite strict export controls under both the Trump and Biden administrations, the PLA retains access to AI chips and other advanced equipment for military applications through commercial purchases from Chinese academic institutions and private companies (Fedasiuk, Elmgren and Lu 2022).

Chinese Military Applications of AI

Chinese military analysts have advanced their understanding of intelligent warfare with a key focus on intelligent combat systems. Taken as a whole, China's ambition is to develop a world-class military by leveraging a passion for adopting cutting-edge technologies, and this clear focus constitutes the foundation of the PLA's rapid advancement.

This strategy includes an emphasis on autonomous or unmanned systems and a core focus on acquiring military superiority in algorithms, information/data and the cognitive capabilities of AI (Guo 2021), as well as AI-powered decision making on the battlefield (Zhang 2020; Cranny-Evans 2022). Other applications of AI include training, simulation, wargaming and organizational reform, as well as the transformation of military doctrine in line with the future of "intelligentized" warfare (Zhang 2020).

Unmanned Intelligent Combat Platforms

While trying to catch up with the United States, China has developed one of the largest and most comprehensive unmanned combat aerial vehicle (UCAV) systems in the world. After two decades of R&D, these systems are able to cover UAVs for reconnaissance (the BZK, CH and WZ series), reconnaissance-strike (the BZK, CH and WZ series) and combat (the Dark Sword series), as well as drone helicopters, suicide drones and drone spaceplanes.

Work in this domain began in the 1990s as China's state-owned institutions, such as the China Academy of Aerospace Aerodynamics, began research on a new generation of UAVs for military use. As Chinese UCAVs have a better cost-performance ratio than their American equivalents, China has become the world's leading exporter of combat drones, with CH4, Wing Loong-1 and Wing Loong-2 among the bestselling drones in its major export market in the Middle East, as well as in Myanmar, Pakistan and Serbia (Rasheed 2023).

Closely following the applications and practices of UAVs in the US military, China began to establish its own drone forces in the PLA air force around 2011,[4] and its own reconnaissance-strike drones began to be equipped into combat systems in 2012. For example, the Wing Loong GJ-1 reconnaissance-strike drones first participated in a live exercise across the PLA's armed forces in 2014 (Wang, Jinyang and Xiaoyuan 2017; Huang, Ri and Chunming 2017). China has since equipped UCAVs in the PLA air force, army and navy (Zhuang, Chen and Xu 2022). Advanced supersonic, high-altitude, stealth-reconnaissance drones, such as the WZ-8, as well as high-altitude, long-endurance, reconnaissance-strike drones, such as the Rainbow CH-5, Wing Loong-2, Wing Loong-3 and the stealth-strike drone Hongdu GJ-11, have all been equipped in the Chinese military in recent years.

The Use of Drone Swarms

One of the areas in which the PLA has deployed significant resources is the use of networked

4 In May 2017, China's major official media, including CCTV, Xinhua News Agency and *Guangming Daily*, as well as military media such as the *PLA Daily*, intensely reported the achievements of Li Hao, a hero drone pilot. China had begun to establish its drone forces around 2011 at a regimental and brigade level. More information can be found in a special comprehensive report by Ri Wang, Liu Jinyang and Sun Xiaoyuan (2017).

UAVs or drone swarms. The use of drone swarms has been considered by the Chinese military as one of the most innovative and potentially effective methods of combat moving forward. The key technology for leveraging drone swarms is networked communication. Networked drones enable automated tasks without the need for human operators. For example, drone swarms can already navigate complicated terrain such as forests in order to find targets.

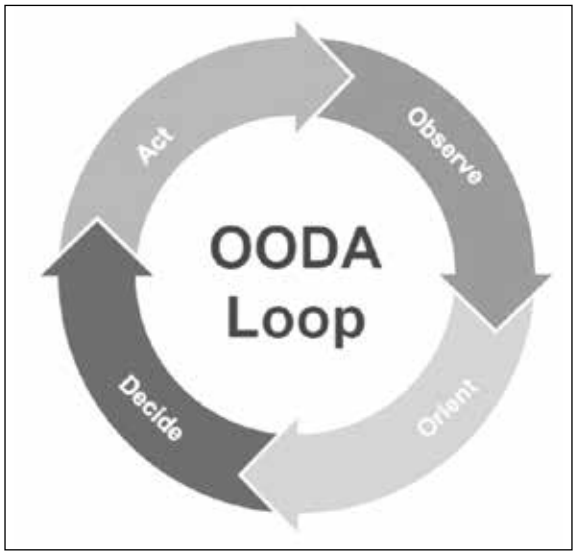
The PLA is catching up with the United States in this regard; Perdix, the US military drone, has the ability to forge the attack of drone swarms on the battlefield. During military training in 2023, China's National University of Defense Technology demonstrated that dozens of drones in swarms, supported by machine-learning algorithms, seemed to successfully collaborate in recovering from jamming signals and in autonomously finding and destroying targets without the need for human operators (Political Work Department of the Central Military Commission 2023).

At sea, high-speed UAVs in swarms could potentially combat aircraft carriers in future intelligent warfare. The Chinese company Yunzhou Tech, a major unmanned surface vehicle manufacturer and "a highly typical military-civil fusion enterprise,"[5] showed the capability of coordinating 56 unmanned boats in swarms in 2018, and a trial in 2021 demonstrated a breakthrough in coordinating six high-speed unmanned vessels to quickly intercept, besiege and expel invasive targets (Siqi 2021). In January 2023, the AI-powered unmanned drone carrier Zhu Hai Yun was delivered into service. Zhu Hai Yun, a semi-autonomous drone mothership, can launch, recover and coordinate more than 50 unmanned air, surface and undersea vehicles for reconnaissance and ocean surveillance (*Global Times* 2023).

Intelligent Command and Control Systems in Decision Making

In recent years, PLA researchers and officials have put significant emphasis on the use of AI in assisting military command and control (C2). Driven by increasingly complex combat situations, PLA strategists understand that AI will be widely used in C2, dramatically accelerating the observe-orient-decide-act (OODA) decision-making loop (see Figure 3). AI is expected to expand situational awareness, while assisting in the analysis of combat missions and the formation, simulation and control of operational planning and resource allocation (Ji and Wang 2020; Zhao et al. 2022). The speed and accuracy of decision making — in other words, better decision-making within shorter time cycles — will increasingly depend on the use of big data and algorithms.

Figure 3: OODA Loop



Source: Authors.

At the same time, AI-enabled military decision making in the form of intelligent C2 remains largely theoretical and limited to only a few areas within the broader Chinese military (Sun et al. 2020). According to open-source information, AI-assisted decision making remains at a preliminary stage of development, in which AI systems can only execute the directives from human operators (Yang 2023; Wang 2021). There are several choke points that restrict China from building the capabilities of intelligent C2, in particular a lack of data from real wars and large models for machine-learning training. This keeps the use of AI in C2 at an early stage of development (Zhao et al. 2022).

According to the 2022 and 2023 reports produced by the US Department of Defense, the PLA has begun to explore a new core operational concept called multi-domain precision warfare (MDPW).

5 Cited by the founder of Yunzhou Tech, Yunfei Zhang. See Huaqiu.com (2018).

The basic idea of MDPW is to leverage command, control, communications, computers (C4) and ISR to develop a C4ISR network that will "rapidly identify key vulnerabilities in the U.S. operational system and then combine joint forces across domains to launch precision strikes against those vulnerabilities" (US Department of Defense 2023).

Military observers view the MDPW as the PLA's own version of the joint all-domain command and control (JADC2) developed by the US military. MDPW reflects Chinese asymmetric warfare in finding and attacking the weakest links in the US operational system in order to paralyze and neutralize the system as a whole (Stokes, Sullivan and Greene 2023; Magnuson 2023).

Judging by the latest development in intelligent C2 and bottlenecks constricting its ability to develop intelligent systems, China's military is not yet capable of carrying out MDPW. The latest report, "China's national defense in the new era" (2019), emphasizes "joint operations command," but says nothing about multi-domain precision warfare (State Council Information Office 2019). The outline for the PLA joint operation trial issued in the following year, as well as the one-year implementation report for the outline in January 2022, emphasized a C2 system for joint operations across domains — land, air, sea, space and cyberspace (Han, Bing and Jianwei 2022).

At present, the research on applications of AI for C2 and decision making in the PLA is mostly focused on the operational level (Yang 2023; Stokes 2024). With regard to decision making at the strategic level, PLA scholars insist that humans should remain in control of AI systems. Chinese researchers seek to develop greater expertise in machine learning and tactical decision making. As of 2021, the capability of the PLA is limited to operating through remote control at a short and medium range (Lu et al. 2021).

Building on applications of AI, wargaming competitions in China have demonstrated that the PLA has developed AI decision-making systems with improved levels of automation and precision strike; examples of these AI systems include "Prophet" and "War Skull" (Fan, Mengying and Qiang 2021). Notwithstanding these achievements, these AI systems have been trained on data generated by computerized wargaming and simulation without the input of real war data. This remains a great obstacle for the PLA in training its AI-powered C2 systems.

Global Governance of Military AI

Global regulation of military AI poses several unique risks that overlap the pace and distribution of algorithmic technologies. For this reason, diplomatic efforts to regulate military AI are vital to avoiding "accidental conflict." By garnering support from a wide range of nations on the application of AI to military affairs, the Political Declaration on REAIM could help in fostering international collaboration and consensus building in addressing the integration of AI into military operations.

Given the inherent dangers of AI, diplomatic engagement between the United States and China will be critical to regulating a new generation of weapons technology. Indeed, responsible engagement between the two countries could form the basis for underwriting broader global security efforts. By promoting the responsible use of military AI, US-China dialogue could foster the trust needed to minimize potential risks and uphold international norms that intersect military technologies.

While no one state, institution or political body has sufficient capacity to govern military AI on a global scale, the strategic direction followed by the United States and China will have an outsized impact on AI governance. By encouraging active involvement in shaping the regulatory landscape, these two technology giants could be pivotal to regulatory cooperation on the weaponization of AI.

In truth, global governance of AI remains an enormous challenge. Notwithstanding the lack of universally agreed-upon norms and standards with regard to the use of military AI, the very speed and scale of AI research is outstripping the capacity of policy makers to develop and implement oversight. Moreover, the secretive nature of R&D programs can hinder transparency and accountability, exacerbating mistrust and creating barriers to international cooperation.

China's Approach to Global Governance of Military AI

China's approach to global governance of military AI and robotics largely conforms to Beijing's broader stance on international affairs (for example, emphasizing the principle of sovereignty and territorial integrity in opposition to political hegemony). More specifically, China's government advocates for the right to develop national military AI systems, while paying special attention to the security risks of unchecked weapons development.

China first submitted its position paper to the United Nations on December 13, 2021. Titled, the "Position Paper on Regulating Military Application of Artificial Intelligence," the paper calls for the adoption of a prudent and responsible attitude toward R&D on military AI. It argues against seeking absolute military advantage or damaging global strategic balance and stability by undermining the sovereignty and territorial security of other countries. More concretely, the paper advocates for the principle of "AI for good," ensuring that AI-related weapons systems remain "under human control" (Permanent Mission of the People's Republic of China to the UN Office at Geneva 2021).

In light of LAWS, China holds an ambiguous position. While most other major military powers (including Britain, Israel, Russia and the United States) oppose a pre-emptive LAWS ban (Sayler 2023), China supports a ban on the condition that a common understanding of the characteristics of LAWS is defined.[6] In fact, China has held this position since it first participated in the framework of the UN Convention on Certain Conventional Weapons (Ministry of Foreign Affairs, China 2017).

On the military front, China and the United States face a typical security dilemma with regard to the military application of AI. China has closely followed the frontier development of AI technology in the United States and has made a concerted effort to learn from and catch up with it. At the same time, the US military closely watches the development of military AI in China, out of concern that the PLA might secretly develop some mystery military AI applications that could threaten US military dominance.[7] The application of generative AI tools such as ChatGPT in the military is the latest case in point — the Chinese military is closely following trends in the US military in this regard, and vice versa.

Fortunately, both the US and Chinese governments understand the critical importance of multilateral engagement in shaping and regulating military AI. At the Biden-Xi meeting in San Francisco in November 2023, for example, military AI was a key feature of discussion. In fact, both Beijing and Washington have pledged to support defence policy coordination talks, military maritime consultation meetings and direct telephone links between operational commanders.

The first US-China AI dialogue was held on May 14, 2024, in Geneva, with the two countries exchanging "perspectives on their respective approaches to AI safety and risk management."[8] Prior to this, the unofficial Track II dialogue on AI in national security between the Brookings Institution and the Center for International Security and Strategy at Tsinghua University laid some groundwork for the forthcoming US-China official AI dialogue (Hass and Kahl 2024).

Scholars participating in Track II dialogue on AI have managed to come to a consensus that governance of military AI is of crucial importance and cannot be ignored. Exploratory collaboration has been carried out with achievements in the building of a common glossary for 25 AI terms in support of mutual understanding (Xiao and Zhu 2024), the principle of human control of AI-enabled weapon systems and decision making on the use of nuclear weapons (Hass and Kahl 2024). Beyond bilateral dialogue, both the United States and China participated in the first AI Safety Summit hosted by then British Prime Minister Rishi Sunak in November 2023 and signed the Bletchley Declaration on the strategic risks posed by the applications of military AI.

6 See Permanent Mission of the People's Republic of China to the UN Office at Geneva (2023).

7 China's discussion of using MDPW to fight against the US JADC2 is a perfect case of this security dilemma between the two countries in the field of military AI. The Pentagon is concerned that the PLA would develop the capability to find vulnerability in the US JADC2 system, while the Chinese military is worried about being left even further behind the US military in the intelligent war as represented by the JADC2 system.

8 See The White House (2024).

Conclusion

AI and robotics can be expected to redefine the boundaries of national security, influencing long-term decision making in both military planning and multilateral governance. Developing effective multilateral forums in which policy makers, industry experts, researchers and civil society might share concerns remains vital to regulating against the dangers of military AI. Given the substantial importance of US-China relations in driving the advancement of AI and robotics, new pathways for dialogue are needed.

Together, the United States and China should seek to support discussions on the ethical guidelines and responsible use of AI in military applications through initiatives such as the Global Partnership on Artificial Intelligence and engagements in multilateral forums such as the United Nations. These efforts could help to foster collaboration among nations while addressing concerns about AI's impact on international security, human rights and the laws of armed conflict. By promoting dialogue and cooperation, both countries could ensure that competition in military AI does not undermine global stability or destabilize international peace and security.

Notwithstanding current tensions, there have been instances of dialogue and cooperation between the United States and China on AI-related issues in the past. Indeed, both nations inherently understand the importance of mitigating the dangers of unchecked technological advancement. As two of the world's most innovative nations, the United States and China have a significant stake in shaping the future trajectory of AI regulation (Horowitz and Scharre 2021).

Given the dangers of deploying military AI without guardrails, the risk of escalation and/or miscalculation will remain a significant problem. In truth, these are the same existential risks driving concerns over nuclear proliferation. Like nuclear weapons, the risk of "mutually assured destruction" offers a frame of reference for understanding the future of military AI. Without oversight in the application of AI to military affairs, the speed and scale of warfare could simply spiral out of control.

Policy Recommendations

The dangers of unchecked weapons proliferation across a fragmented multipolar system are vast. Moving forward, effective US-China engagement will require a nuanced approach to governance that acknowledges both the shared risks of military AI and the areas of policy divergence. Addressing challenges on the horizon requires concerted efforts to foster dialogue, build trust and develop inclusive governance frameworks that accommodate diverse perspectives while upholding fundamental principles on ethics, human rights and international law.

Achieving consensus between nations with divergent priorities and interests is always a daunting challenge. Nonetheless, diplomatic relations remain fundamental to fostering global governance on military AI.

Taken as a whole, US-China diplomatic engagement could serve as a foundation for broader multilateral efforts. Diplomatic engagement between the United States and China could include: dialogue on responsible AI principles; capacity building and education; research collaboration; risk assessment and mitigation; and/or track diplomacy (see Table 1).

Given the discordant views of military AI held by governments around the world, deliberate engagement could mean the difference between risk reduction and military conflict. Indeed, the goal of fostering global governance on military AI and robotics should be seen in generational terms as a fundamental feature of a new era in algorithmic weapons technologies.

Table 1: Policy and Planning

Framing US-China Engagement
Dialogue on Responsible AI Principles US-China engagement requires dialogue on AI practices, including guidelines and accountability on AI technologies, with the purpose of building consensus on a set of ethical principles for AI development and deployment — especially military AI.
Capacity Building and Education Collaboration on educational initiatives that develop professional expertise on military AI law and policy. This might include workshops, training programs and academic exchanges to ensure that policy makers and legal experts are well-informed about the implications of military AI.
Research Collaboration Collaboration and joint research initiatives between US and Chinese researchers that address common challenges around AI transparency. Collaborative research could help with consensus-building around ethical guidelines and best practices.
Risk Assessment and Mitigation Building consensus on strategies for risk assessment and mitigation across the domain of military AI. Establishing mechanisms for sharing information on potential risks and incidents, ensuring a coordinated response to emerging challenges across a multipolar security environment.
Track Diplomacy Utilizing diplomatic channels to address AI-related concerns in fostering a shared commitment to responsible AI development. Track diplomacy could include working toward shared international standards for the development of military AI with the aim of harmonizing regulations, technical standards and ethical frameworks in order to reduce the risk of an AI arms race.

Source: Author.

Works Cited

Ashford, Emma and Evan Cooper. 2023 "Yes, the World Is Multipolar." *Foreign Policy*, October 5. https://foreignpolicy.com/2023/10/05/usa-china-multipolar-bipolar-unipolar/.

Bresnahan, Timothy F. and M. Trajtenberg. 1995. "General purpose technologies 'Engines of growth'?" *Journal of Econometrics* 65 (1): 83–108. www.sciencedirect.com/science/article/pii/030440769401598T.

Brose, Christian. 2019. "The New Revolution in Military Affairs: War's Sci-Fi Future." *Foreign Affairs* 98 (3): 122–34. www.foreignaffairs.com/united-states/new-revolution-military-affairs.

Center for Strategic & International Studies. 2024. "The State of DOD AI and Autonomy Policy." Event transcript. January 9. www.csis.org/analysis/state-dod-ai-and-autonomy-policy.

Cranny-Evans, Samuel. 2022. "The role of AI in the People's Liberation Army." Army Technology, June 24. www.army-technology.com/features/the-role-of-ai-in-the-peoples-liberation-army.

Defense Advanced Research Projects Agency. 2020. "Creating Cross-Domain Kill Webs in Real Time." September 18. www.darpa.mil/news-events/2020-09-18a.

Fan, Ning, Zhu Mengying and Zhang Qiang. 2021. "超阿尔法狗? '战'成战助决策 '最强大'" [Far more than Alpha Dog? "War Skull" becomes the "strongest brain" to assist decision-making on the battlefield]. *科技日报* [Science and Technology Daily], April 19. http://digitalpaper.stdaily.com/http_www.kjrb.com/kjrb/html/2021-04/19/content_466128.htm?div=-1.

Fedasiuk, Ryan, Karson Elmgren and Ellen Lu. 2022. "Silicon Twist: Managing the Chinese Military's Access to AI Chips." CSET Policy Brief. June. https://cset.georgetown.edu/publication/silicon-twist/.

Fedasiuk, Ryan, Jennifer Melot and Ben Murphy. 2021. *Harnessed Lightning: How the Chinese Military is Adopting Artificial Intelligence*. CSET. October. https://cset.georgetown.edu/publication/harnessed-lightning/.

Fravel, M. Taylor. 2020. "China's 'World-Class Military' Ambitions: Origins and Implications." *Washington Quarterly* 43 (1): 85–99. https://doi.org/10.1080/0163660X.2020.1735850.

Global Times. 2023. "China builds world's first autonomous seaborne drone-carrier." January 13. www.globaltimes.cn/page/202301/1283744.shtml.

Government of the Netherlands. 2023. "REAIM Call to Action." February 16. www.government.nl/ministries/ministry-of-foreign-affairs/documents/publications/2023/02/16/reaim-2023-call-to-action.

Guo, Ming. 2021. "于智能化战争的基本知" [Basic understanding of intelligent warfare]. *人民坛. 学术前沿* [Frontiers] August 11. www.rmlt.com.cn/2021/0811/621409.shtml.

Han, Lin, Wei Bing and Liu Jianwei. 2022. "中国人民解放联合作战要(行)》实施一周年述" [Overview of the first anniversary of the implementation of the Joint Operations Outline of the Chinese People's Liberation Army (Trial Implementation)]. *People's Liberation Army Daily*, January 5. www.mod.gov.cn/gfbw/qwfb/4902340.html.

Hass, Ryan and Colin Kahl. 2024. "Laying the groundwork for US-China AI dialogue." Brookings, April 5. www.brookings.edu/articles/laying-the-groundwork-for-us-china-ai-dialogue/.

He, Alex. 2022. "The Digital Silk Road and China's Influence on Standard Setting." CIGI Paper No. 264. Waterloo, ON: CIGI. www.cigionline.org/publications/the-digital-silk-road-and-chinas-influence-on-standard-setting/.

Horowitz, Michael C. and Paul Scharre. 2021. *AI and International Stability: Risks and Confidence-Building Measures*. Center for a New American Security. January. www.cnas.org/publications/reports/ai-and-international-stability-risks-and-confidence-building-measures.

Huang, Zijuan, Wang Ri and Yao Chunming. 2017. "空首批无人机飞行李浩: 从 '零' 始飞" [Li Hao, the first drone pilot of the Air Force: Start flying from "zero"]. 人民网-事道 [People's Daily — Military Channel,] May 23. http://military.people.com.cn/n1/2017/0523/c1011-29295213.html.

Huaqiu.com. 2018. "中国无人艇 '群' 突 海上无人作战 '群'端倪" [China's unmanned boat "shark group" rushes in, and the unmanned combat "group" at sea shows clues]. Global Network, May 31. www.youuvs.com/news/detail/201805/330.html.

Ji, Zili and Wenhua Wang. 2020. "人工智能在作战指中的用" [Application of Artificial Intelligence in Command and Control]. 事文摘 [Military Digest] 9: 16–20.

Jin, Zhuanglong. 2018. "新时代民融合深度发展新局面" [Create a new situation of in-depth development of military-civilian integration in the new era]. 求是 [Qiushi Magazine], July 16. www.xinhuanet.com/politics/2018-07/16/c_1123133733.htm.

Kania, Elsa B. 2017. *Battlefield Singularity: Artificial Intelligence, Military Revolution, and China's Future Military Power.* Washington, DC: Center for a New American Security. November. www.cnas.org/publications/reports/battlefield-singularity-artificial-intelligence-military-revolution-and-chinas-future-military-power.

———. 2020. "AI weapons" in China's military innovation. Brookings and CSET, Global China Project. April. www.brookings.edu/articles/ai-weapons-in-chinas-military-innovation/.

Khanna, Parag. 2019. *The Future Is Asian.* New York, NY: Simon & Schuster.

Lu, Zhigang et al. 2021. "地面无人系统作战的指与控制智能化" [Intelligence of Command and Control in Formation Operation of Unmanned Ground Systems]. *指与控制学报* [Journal of Command and Control] 7 (4). December.

Magnuson, Stew. 2023. "Special Report: China Pursues Its Own Version of JADC2." *National Defense Magazine*, July 13. www.nationaldefensemagazine.org/articles/2023/7/13/china-pursues--its-own-version-of--jadc2.

Marijan, Branka. 2023. "We Need Hard Laws on the Military Uses of AI — and Soon." Opinion, Centre for International Governance Innovation, November 20. www.cigionline.org/articles/we-need-hard-laws-on-the-military-uses-of-ai-and-soon/.

Mearsheimer, John J. 2014. *The Tragedy of Great Power Politics.* Updated ed. New York, NY: W. W. Norton & Co.

Ministry of Foreign Affairs, China. 2017. "中国代表团团长傅聪大使在《特定常武器公》框架下"致命性自主武器系统"首次政府家会上的发言" [Speech by Ambassador Fu Cong, head of the Chinese delegation, at the first government expert meeting of the "Lethal Autonomous Weapons System" under the framework of the Convention on Certain Conventional Weapons]. November 13. www.mfa.gov.cn/web/wjb_673085/zzjg_673183/jks_674633/fywj_674643/201902/t20190201_7668785.shtml.

National Intelligence Council. 2021. "The Future of the Battlefield." NIC-2021-02493. April. www.dni.gov/files/images/globalTrends/GT2040/NIC-2021-02493--Future-of-the-Battlefield--Unsourced--14May21.pdf.

Permanent Mission of the People's Republic of China to the UN Office at Geneva. 2021. "Position Paper of the People's Republic of China on Regulating Military Applications of Artificial Intelligence (AI)." December 13. http://geneva.china-mission.gov.cn/eng/dbdt/202112/t20211213_10467517.htm.

———. 2023. "Statement by H. E. Ambassador SHEN Jian, the Head of Chinese Delegation at the 2023 Meeting of the High Contracting Parties to the CCW." November 21. http://geneva.china-mission.gov.cn/eng/dbtxwx/202311/t20231121_11184852.htm.

Political Work Department of the Central Military Commission. 2023. *《逐梦》第七集：《勇当事变革的先》* ["'Dreams' Episode 7: Be the Pioneer of Military Reform"]. August 4. www.mod.gov.cn/gfbw/spbb_214126/16242541.html.

Qiao, Liang and Xiangsui Wang. 1999. 超限战 [Unrestricted Warfare]. Beijing, China: 解放文艺出版社 [People's Liberation Army's Literature and Arts Publishing House].

Rasheed, Zaheena. 2023. "How China became the world's leading exporter of combat drones." Al Jazeera, January 24. www.aljazeera.com/news/2023/1/24/how-china-became-the-worlds-leading-exporter-of-combat-drones.

Romei, Valentina and John Reed. 2019. "The Asian century is set to begin." *Financial Times*, March 25. www.ft.com/content/520cb6f6-2958-11e9-a5ab-ff8ef2b976c7.

Sayler, Kelley M. 2023. "International Discussions Concerning Lethal Autonomous Weapon Systems." Congressional Research Service, updated February 14. https://crsreports.congress.gov/product/pdf/IF/IF11294.

Scharre, Paul. 2018. *Army of None: Autonomous Weapons and the Future of War.* New York, NY: W. W. Norton & Co.

Siqi, Cao. 2021. "Unmanned high-speed vessel achieves breakthrough in dynamic cooperative confrontation technology: developer." *Global Times*, November 28. www.globaltimes.cn/page/202111/1240135.shtml.

State Council Information Office. 2015. *中国的事战略* [China's military strategy]. Xinhua News Agency, May. www.gov.cn/zhengce/2015-05/26/content_2868988.htm.

———. 2019. *新时代的中国国防* [China's national defense in the new era]. Xinhua News Agency. July. www.gov.cn/zhengce/2019-07/24/content_5414325.htm.

Stokes, Jacob. 2024. "Military Artificial Intelligence, the People's Liberation Army, and U.S.-China Strategic Competition." Testimony before the US-China Economic and Security Review Commission, US Congress. Center for a New American Security, February 1. www.cnas.org/publications/congressional-testimony/military-artificial-intelligence-the-peoples-liberation-army-and-u-s-china-strategic-competition.

Stokes, Jacob, Alexander Sullivan and Noah Greene. 2023. *U.S.-China Competition and Military AI.* Washington, DC: Center for a New American Security. July. www.cnas.org/publications/reports/u-s-china-competition-and-military-ai.

Sun, Yuxing et al. 2020. "智能指与控制系统发展路径与未展望" [The Development Path and Future Outlook of Intelligent Command and Control Systems]. 火力与指控制 [Fire Control and Command Control] 45 (11): 60–66.

The Central People's Government of the People's Republic of China. 2017. "中共中央政治局召会决定设立中央民融合发展委会" [The Political Bureau of the Central Committee of the Communist Party of China held a meeting. Decided to establish the Central Military-Civilian Integration Development Committee]. Xinhua News Agency, January 22. www.gov.cn/xinwen/2017-01/22/content_5162263.htm.

———. 2018. "近平: 新时代民融合深度发展新局面" [Xi Jinping: Create a new situation of in-depth development of military-civilian integration in the new era]. Xinhua News Agency, March 2. www.gov.cn/guowuyuan/2018-03/02/content_5270143.htm.

———. 2020. "近平主持中央政治局第二十二次集体学并" [Xi Jinping presided over the 22nd collective study and speech of the Political Bureau of the Central Committee]. Xinhua News Agency, July 31. www.gov.cn/xinwen/2020-07/31/content_5531665.htm.

———. 2021. *中华人民共和国国民经济和社会发展第十四个五年划和2035年景目要* [The 14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and the Outline of Long-term Goals for 2035]. Xinhua News Agency, March 13. www.gov.cn/xinwen/2021-03/13content_5592681.htm.

The White House. 2023. "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence." October 30. www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence.

———. 2024. "Statement from NSC Spokesperson Adrienne Watson on the U.S.-PRC Talks on AI Risk and Safety." Statements and releases, May 15. www.whitehouse.gov/briefing-room/statements-releases/2024/05/15/statement-from-nsc-spokesperson-adrienne-watson-on-the-u-s-prc-talks-on-ai-risk-and-safety-2/.

Theoretical Learning Center Group of the Party Committee of National Defense University. 2018. "把人民全面建成世界一流" [Build the People's Army into a world-class army in an all-round way]. 求是 [Qiushi Magazine] June 29. www.qstheory.cn/dukan/qs/2018-06/29/c_1123054429.htm.

US Department of Defense. 2023. *Military and Security Developments Involving the People's Republic of China* Annual Report to Congress. https://media.defense.gov/2023/Oct/19/2003323409/-1/-1/1/2023-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF.

Wang, Fengchun. 2021. "智能化指决策力生成研究" [Research on Generation of Intelligent Command Decision-Making Capability]. 兵工自动化 [Ordnance Industry Automation] 40 (11): 27–31. http://bgzdh.ijournals.com.cn/bgzdh/article/pdf/20211107.

Wang, Ri, Liu Jinyang and Sun Xiaoyuan. 2017. "戈壁-空某基地无人机飞行李浩" [Casting Sword Gobi — Li Hao, a drone pilot of an experimental training base in the Air Force]. CCTV, May 25. https://news.cctv.com/special/lihao/.

World Intellectual Property Organization. 2024. *Generative Artificial Intelligence*. Patent Landscape Report. Geneva, Switzerland: World Intellectual Property Organization. www.wipo.int/web-publications/patent-landscape-report-generative-artificial-intelligence-genai/en/index.html.

Xiao, Qian and Rongsheng Zhu. 2024. "Opportunities in Dialogues Regarding AI." China-US Focus, April 26. www.chinausfocus.com/peace-security/opportunities-in-dialogues-regarding-ai.

Xinhua News Agency. 2015. "两会授发布: 近平出席解放代表团全体会" [Authorized release of the Two Sessions: Xi Jinping attended the plenary meeting of the PLA delegation]. March 12. www.xinhuanet.com//politics/2015-03/12/c_1114622624.htm.

Yang, Zi. 2023. "How China Leverages Artificial Intelligence for Military Decision-Making." In *China's Military Decision-Making in Times of Crisis and Conflict*, edited by Roy D. Kamphausen, 69–88. Seattle, WA, and Washington DC: The National Bureau of Asian Research.

Yergin, Daniel and Joseph Stanislaw. 1998. *The Commanding Heights: The Battle for the World Economy*. New York, NY: Simon & Schuster.

Zakaria, Fareed. 2012. *The Post-American World: Release 2.0*. New York, NY: W. W. Norton & Co.

Zhang, Jiayu. 2020. "China's Military Employment of Artificial Intelligence and Its Security Implications." *The International Affairs Review* (blog), August 16. www.iar-gwu.org/print-archive/blog-post-title-four-xgtap.

Zhao, Wei et al. 2022. 基于人工智能的智能化指决策和控制 [Intelligentized Command Decision-Making and Control base on Artificial Intelligence]. *信息安全与通信保密* [Information Security and Communications Privacy] 2: 2–8. www.163.com/dy/article/H3IQ996P0552NPC3.html.

Zhuang, Guoping, Jinping Chen and Mingjing Xu. 2022. "中国大 '机械化信息化智能化融合发展' 之研究" [Comparative research on the "integration and development of mechanization, information technology and intelligence" in mainland China]. *空学术双月刊* [Air Force Academic Bimonthly] 688. June. Ministry of National Defense, Republic of China. www.mnd.gov.tw/PublishMPPeriodical.aspx?title=%u8ecd%u4e8b%u520a%u7269&id=9.

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