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ARTIFICIAL INTELLIGENCE FOR STRATEGIC DECISIONING IN MILITARY

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1. Abstract

This research paper explores the pivotal role of Artificial Intelligence (AI) as a catalyst for strategic decision-making in military operations. Delving into the dual nature of AI's impact, the study meticulously examines both its advantages and drawbacks in the military domain. Evaluating the ethical and legal dimensions, the paper sheds light on the intricate considerations surrounding AI implementation in military strategies. Furthermore, it delves into potential solutions, offering insights into mitigating risks and challenges associated with the integration of AI in military decision-making processes. The findings of this research contribute to a nuanced understanding of leveraging AI in military contexts while addressing the imperative need for ethical and legal frameworks to govern its application.

Keywords: Artificial intelligence**,** Machine learning, Robotics, Big data

2. Introduction

The inception of AI can be attributed to Alan Turing, a renowned mathematician and a pioneer in the field of computer science who delved into the fundamental question of whether machines could possess the capacity to think. Turing introduced what he termed the "imitation game", which is now commonly known as the "Turing test". In this test, he proposed a scenario where a computer and a human are placed in separate rooms. The human would ask a series of questions aimed at discerning whether they were conversing with a machine or another human. Turing posited that, with time, a computer could be programmed to respond to these questions so convincingly that it would be practically impossible to distinguish it from a human respondent. This led to the deeper philosophical question: Does this capability imply that the computer can genuinely think?

Meanwhile numerous military systems experienced increasing levels of automation without being widely associated with AI, at least in the public's perception. For instance, as early as the 1940s, certain aircraft and air defense radars were equipped with transponders, enabling radar operators, and eventually the radar systems themselves, to interrogate the aircraft they were tracking to determine their friend or foe status. In subsequent years, tactical and strategic warning systems were developed to identify aircraft and missiles by matching radar return characteristics, such as speeds, shapes, or heat signatures, with databases of known threats. By the 1970s, surface-to-air and air-to-air missiles had the capability to autonomously adjust their course and track their targets using radar or heat-seeking sensors. Over the next couple of decades, air defense systems became increasingly sophisticated and could provide engagement recommendations or even autonomously engage targets when set in automatic fire mode. However, these systems, despite their growing autonomy, did not raise concerns about "killer robots" running out of control, largely due to the limited scope of their decision-making capabilities. However, a significant shift in AI research and development (R&D) occurred in the late 1990s, marked by an acceleration in the pace of advances in the field. One of the first notable milestones that captured widespread public attention took place in 1997 when IBM's intelligent system, Big Blue, defeated the reigning world chess champion, Gary Kasparov, in a six-game match. Another remarkable achievement occurred in 2016, when Google DeepMind's AlphaGo system defeated Lee Sedol, the world's top-ranked player in the complex Asian game of Go, with a score of four games to one. This breakthrough was far more than an incremental improvement in capability. While chess has 20 possible first moves per side and approximately 10^120 total possible board configurations, Go presents an even more immense challenge with 361 possible first moves per side and an estimated 10^170 total possible board configurations—believed to surpass the total number of atoms in the universe. This progress reflects a fundamental shift in the approach to AI development in recent years. Early AI research emphasized programming and computational complexity, but contemporary approaches have shifted their focus toward machine learning.

In the years following Big Blue's historic victory, AI research has made remarkable strides in various fields, including computer vision, speech recognition, natural language processing, and robotics.

3. AI as an enabler for strategic decisioning in military

Given AI's widespread influence, it's unsurprising that AI holds great promise for national defense. The growing use of robotic vehicles and autonomous weapons allows them to operate in combat zones that are too hazardous for human soldiers. Intelligent defensive systems are progressively better at detecting, analyzing, and responding to attacks with greater speed and efficiency than human operators. Additionally, big data analysis and decision support systems offer the potential to process vast amounts of information, far beyond the capacity of even the largest group of human analysts. This capability can aid military decision-makers in selecting better courses of action more rapidly, potentially transforming the nature of warfare in the years to come.

AI is evolving into an indispensable component for modern warfare, offering distinct advantages over traditional systems in terms of processing large volumes of data more efficiently. Additionally, AI is contributing to the development of self-control, self-guidance, and the self-activation of battle scenarios. Military experts are increasingly exploring the effective use of artificial intelligence in various military applications, spanning surveillance, underwater mine warfare, reconnaissance, cyber security, threat assessment, intelligence analysis, command and control, education, and military training. In just a decade, artificial intelligence (AI), especially in the subfields of machine learning (ML) and deep learning (DL), has transitioned from being predominantly a research institution and university prototype to being widely applied in real-world industry settings. On a tactical level, AI offers the potential to enhance the partially autonomous control of unmanned systems, enabling human operators to operate these systems more efficiently.

One of the most prominent advancements in autonomous robotics has been in the realm of self-driving vehicles. The potential military applications of this technology have spurred their development, with the U.S. Department of Defense (DoD) playing a significant role. In 2004, DARPA initiated the DARPA Grand Challenge, offering a $1 million prize for the first self-driving vehicle to complete a 142-mile desert race. While none of the entrants finished the race that year, DARPA persisted, and in the subsequent year's competition, five of the 20 contestants successfully crossed the finish line, with Stanford University's team winning a $2 million prize. The momentum continued with the Urban Challenge in 2007, in which a team from Carnegie Mellon University secured victory, navigating city streets with real-world traffic challenges.

These developments, coupled with earlier breakthroughs like computer reasoning, image recognition, and precision-guided munitions, pave the way for rapid progress in the development of military AI applications. These emerging capabilities are met with enthusiasm by many military operators as they promise substantial increases in combat power, potentially enabling faster mission accomplishment with reduced exposure to lethal threats.

Several instances where AI can be utilized to bolster military effectiveness:-
Combat platforms: Various military forces worldwide, hailing from different nations, are actively incorporating artificial intelligence components into weaponry and various applications within the realms of ground, naval, air, and space operations. The integration of AI in systems pertinent to these fields has ushered in the advancement of more efficient modes of warfare that rely less on direct human involvement. Additionally, it has led to heightened collective strength and the enhanced performance of sophisticated military systems, all while reducing the maintenance requirements. AI is also poised to explore cooperative assaults using autonomous and swift weapons. Ongoing research endeavors are presently delving into futuristic possibilities and avenues for further advancements in this domain.

Identifying targets: In complex battlefield scenarios, artificial intelligence techniques are strategically employed to enhance the accuracy of target identification. This involves the analysis of diverse data sources, including documents, evidence, news feeds, and various forms of unstructured information. These strategies empower security forces to gain in-depth insights into potential operational decisions. Moreover, artificial intelligence integrated into target recognition systems bolsters the capability of these systems to discern the strategic positioning of their targets.

AI-empowered recognition systems employ probability-based estimations of enemy strategies, factoring in variables such as weather conditions, environmental contingencies, reconnaissance data, and assessments of concealed assets. This aids in determining the proximity of targets and devising effective mitigation plans. Furthermore, machine learning plays a vital role in processing and understanding incoming information. For instance, DARPA's Target Recognition and Adaptation in Contested Environments program utilizes machine learning to rapidly search for and pinpoint targets, aided by synthetic-aperture radar technology. Presently, ongoing research endeavors are focused on exploring cutting-edge features and avenues for further advancements in this field.

Maritime Surveillance: Maritime surveillance traditionally relies on fixed radar stations, patrol aircraft, and ships, and more recently, electronic tracking systems like the automatic identification system (AIS) for maritime vessels. These sources provide vast amounts of data about vessel movements, which could potentially reveal illegal, unsafe, threatening, or anomalous behavior. However, the sheer volume of data makes manual detection of such behavior challenging. As an alternative, machine learning (ML) approaches are employed to create normality models based on vessel movement data. Any vessel movement that deviates from these normality models is flagged as anomalous and presented to operators for manual inspection. Early approaches to maritime anomaly detection used techniques such as the Fuzzy ARTMAP neural network to model normal vessel speeds based on port locations. Others employed associative learning of motion patterns to predict vessel movement based on current location and direction of travel. Unsupervised clustering techniques like Gaussian mixture models (GMM) and kernel density estimation (KDE) were also used. These models enable the detection of vessels that change direction, cross sea lanes, move in the opposite direction, or travel at high speeds. More recent approaches employ Bayesian networks to detect false ship types and unusual vessel movements, including discontinuous, impossible, and loitering patterns. Future developments in maritime anomaly detection should consider the interactions among multiple vessels in the vicinity.

Underwater Mine Warfare: Underwater mines present a significant threat to marine vessels, used to control or deny passage through restricted waters. Mine countermeasures (MCM) aim to locate and neutralize these mines, ensuring freedom of movement. Autonomous underwater vehicles (AUVs) equipped with synthetic aperture sonar (SAS) have become increasingly vital for mine searches, providing high-resolution acoustic imagery of the seafloor. Given the large volume of SAS imagery collected by AUVs, automatic target classification is crucial for distinguishing potential mines from other objects. While the automatic target classification of mines has been a subject of study for some time, the remarkable performance of deep neural networks (DNNs) in image classification has piqued interest in their application for automatic mine detection. Some studies have demonstrated the potential of DNNs for mine detection. For example, one study placed dummy mine shapes, mine-like targets, man-made objects, and rocks on the seafloor across various geographic locations. An AUV was then employed to survey the seafloor with SAS, revealing that DNNs significantly outperformed traditional target classifiers with higher mine detection rates and lower false alarm rates. Similarly, other research involved generating synthetic SAS images of cylinder-shaped objects and diverse seafloor landscapes for DNN training. Future studies could explore methods to discriminate mines from various types of clutter objects, combine detection and classification, and ensure robustness to noise, blur, and occlusion.

4. The upside and downside of AI in military

There are several benefits of leveraging AI in a modern warfare setting:

- Speed of Decision Making: One of the most frequently cited advantages of AI in warfare is its ability to significantly enhance the speed of decision-making. AI has the potential to expedite the observe, orient, decide, and act (OODA) loop, enabling military forces to outpace adversaries in generating offensive options or defending against counteractions. However, it's essential to acknowledge that the timelines in warfare are not always dictated solely by decision processes. Other factors, such as the movement of equipment and munitions, can influence operational timelines. Accelerating decision timelines may also introduce new risks, as more time could be advantageous in certain high-stakes situations or when seeking negotiations. Prioritizing speed in autonomous weapon development might compromise safeguards and robustness.
- Use of Big Data: Big data, which encompasses vast, rapidly generated, and diverse datasets that can overwhelm human analysts, holds potential benefits. AI can harness big data to improve its performance, making sense of large datasets more effectively than humans. Enhanced target detection and vision are facilitated by AI's ability to analyze incoming video and imagery. For instance, AI-driven image recognition surpasses human capabilities and can identify objects that humans might miss. In a military context, AI could be instrumental in identifying known combatants or detecting emotional expressions. The sheer volume of data in the world today ensures that AI's role in processing and understanding this data will continue to grow.
- Mitigation of Manpower Shortages: AI can address the gap between military demand and available personnel for tasks like image analysis and language translation. As the volume of data grows, AI becomes well-positioned to assist with these tasks. AI is also crucial in providing robotic assistance on the battlefield, enabling military forces to maintain or expand their warfighting capacity without increasing manpower.
- Improvements in Cyber Defense: AI intersects with the field of cyber defense, where the constant battle between attackers and defenders is intensifying. Antivirus systems, for instance, are using AI to observe software and flag suspicious actions, improving the identification of malware behavior. While AI has potential for identifying and patching vulnerabilities in friendly systems or attacking enemy systems, these applications are not yet at the level of experienced human operators.
- Enhanced Accuracy and Precision: AI and machines, in general, exhibit greater accuracy and precision compared to humans. Machines can handle tasks that require high precision,

such as fabricating electronic transistors, while humans tend to work with rough estimates. Machine uniformity and precision across time and devices contribute to their accuracy.

- Labor and Cost Reduction: AI and automation are transforming tasks that once required dedicated human intervention, reducing the need for human personnel. This trend allows a single person to accomplish work previously requiring multiple individuals. In the military context, AI's role extends to improving processes and increasing efficiency, leading to cost savings in various areas, from logistics to recruitment.
- Intelligence, Surveillance, and Reconnaissance (ISR): ISR is a primary focus area for military AI investment, as autonomous collection of intelligence via various sensors and drones generates vast amounts of data. AI's analysis of this data enhances the quality of intelligence derived from ISR operations.

While there are significant benefits, AI brings along a host of risks and challenges:

- Artificial Intelligence Systems Might Make Dangerous Errors: Experts mentioned that while AI can offer increased speed, accuracy, and precision, it could also make hasty decisions, struggle to adapt to complex war scenarios, and have difficulty distinguishing between combatants and noncombatants or threats and system anomalies. Moreover, deploying these systems prematurely or their vulnerability to spoofing and hacking by adversaries could exacerbate these issues. Machine learning systems might also exhibit unpredictable behavior, posing safety risks.
- Artificial Intelligence Could Cause Arms Racing or Escalation: Additionally, there's a risk that the pursuit of military AI by different nations to gain a warfighting advantage could lead to proliferation and arms races. Autonomous weapons, lacking sensitivity to political considerations or escalation thresholds, might inadvertently escalate conflicts. The difficulty of attributing blame to human operators in such situations would add complexity. Furthermore, AI's potential to reduce the human cost of war might encourage commanders to take greater risks, inadvertently fueling escalation dynamics.
- Over-reliance of military operators and leaders on artificial intelligence systems: Another concern is the possibility of military operators and leaders placing excessive trust in AI systems. They might succumb to automation bias, relying on AI outputs even when they seem illogical or inexplicable due to the complexity of the underlying algorithms.
- Hacking, Data-Poisoning, and Adversarial Attacks: Another significant risk associated with military AI systems pertains to their vulnerability to malicious actors. Given the prevalence of cyber incidents in both military and civilian networks, it's evident that all network-enabled technologies, including AI, are susceptible to hacking, particularly by determined and well-funded adversaries. Even closed or air-gapped networks can be vulnerable to supply-chain attacks or other means of malicious access. Machine learning systems, which learn from training data, are also susceptible to various types of attacks, such as data-poisoning attacks, where the training data is manipulated to influence the system's intended behavior. AI-enabled systems can fail due to adversarial attacks

intentionally designed to deceive or confuse algorithms, resulting in erroneous outcomes. These examples highlight that even relatively simple AI systems can be fooled in unforeseen ways, potentially leading to significant consequences. It is worth noting that AI-enabled systems could also play a role in defending against hacking, data-poisoning, and other malicious attacks. However, it remains uncertain whether offense or defense will ultimately have the upper hand in such applications. Given this uncertainty and the substantial body of research revealing the vulnerabilities of current AI systems, stakeholders emphasize the importance of taking these risks seriously in the context of military AI.

- Escalation Management: Concerns have also been raised about the risk of a Flash War in the context of military AI. As autonomous systems are more frequently deployed, potentially in close proximity to adversaries using their own autonomous systems, there is a risk that military actions will be executed not just rapidly but at machine speed. This could lead to a reduced space for deliberate diplomatic negotiations, increasing the risk of miscalculations and misunderstandings, and potentially resulting in rapid, unintended, and accidental escalation. The emergent interaction effects of AI systems make it challenging to predict how conflicts might intensify, and managing escalation becomes more difficult.
- Strategic Stability: An additional strategic risk involves the potential erosion of the principles that have maintained relative stability among global powers since World War II. Specifically, AI-enabled systems may advance to the point where they undermine second-strike capabilities crucial for deterring nuclear war through the concept of mutual assured destruction. There is a concern that as AI improves, it could be employed to locate all of an adversary's nuclear launchers. With this capability, an aggressor could potentially attack without fearing nuclear retaliation, or the mere perception that nuclear launchers are vulnerable could encourage a state to launch a first strike to prevent potential loss of nuclear capabilities later in a conflict. Such a scenario could be highly destabilizing and put the world at risk of a catastrophic nuclear event.

5. Ethical and legal considerations of AI in military

Thoughtful individuals have raised significant reservations about the legal and ethical implications of employing AI in military operations or even enhancing security during times of peace. Some of the most vehement objections center on the possibility of machines causing harm to humans without direct human approval, oversight, or the ability to intervene if AI-driven weapons select incorrect targets. These concerns extend to other AI applications, including decision support systems that might advocate for escalatory actions or preemptive attacks without allowing commanders to scrutinize the complex calculations behind such recommendations. Moreover, the use of facial recognition systems or other intricate AI processes could result in the wrongful detention or harm to individuals who are misidentified as terrorists or criminals.

These concerns give rise to profound ethical questions surrounding the military use of AI and the degree to which it should be regulated or restricted in its deployment.

Ethical risks carry significant humanitarian implications. Operational risks revolve around concerns regarding the dependability, vulnerability, and safety of AI systems. Strategic risks encompass scenarios where AI might heighten the chances of conflict, intensify existing disputes, and spread to malevolent entities.

Hartwig von Schubert in article titled “Addressing ethical questions of modern AI warfare”, says, “What everyone needs to be aware of, is that the reliability of this kind of system is subject to technical limits and can only ever deliver a high probability of success, not a guarantee”(Schubert).

Present-day conversations about AI are often shaped by portrayals of AI systems and robots in popular narratives. Even long before the advent of modern robotics, stories existed about human-created anthropomorphic beings rebelling against their creators and escaping. In the mid-1900s, with the emergence of robotics and computer systems, science fiction authors like Stanislaw Lem and Isaac Asimov delved into the conceptual and technical challenges of interacting with robots while ensuring their safety and reliability. Later in the 20th century, movies like "The Terminator" and "The Matrix" disseminated vivid images of extreme risks posed to humanity by self-aware systems equipped with artificial general intelligence (AGI). In these narratives, human-made systems surpass human intelligence and capabilities, pursuing objectives misaligned with human interests and posing existential threats to humanity. These fictional tales continue to resonate, shaping public perceptions of AI and influencing policy recommendations. For instance, the short film "Slaughterbots," created by the Future of Life Institute, portrays the malicious use of highly mobile armed systems capable of autonomously identifying and attacking specified targets. The video urges viewers to "stop autonomous weapons" and has garnered over 2.5 million views.
Whether or not these popular narratives accurately predict future possibilities, they have introduced alarming scenarios with psychological resonance, thereby informing public discourse on AI. However, it's not just fiction writers and the film industry expressing concerns about these risks. AI experts and technology companies have also raised alarm in recent times. Furthermore, international initiatives to restrict the development or utilization of AI systems in military contexts have started to gain momentum. Evidently, a wide array of stakeholders has voiced apprehensions about the risks associated with military AI.

Some of the most vocal proponents expressing concerns about the risks associated with AI are renowned scientists and technologists actively involved in AI research and development. Their focus is not primarily on the long-term existential threats posed by artificial general intelligence (AGI). Instead, they are more concerned with the shorter-term risks related to AI systems that could realistically be developed in the coming years. A notable instance is the 2015 "Open Letter from AI & Robotics Researchers," which highlights worries about the emergence of an AI arms race and the potential proliferation of lethal AI systems in the hands of terrorists or dictators. This letter, endorsed by nearly 4,000 researchers, includes influential technologists such as Stuart

Russell, the late Stephen Hawking, and Elon Musk. It asserts that "most AI researchers have no interest in building AI weapons" and warns that military AI development could trigger a public backlash that restricts the beneficial applications of AI. To ensure that AI can contribute to society's well-being, the letter advocates for a ban on offensive autonomous weapons beyond meaningful human control. The crucial point to underscore here is that some of the most influential AI researchers and developers have expressed alarm about these risks. Their commitment goes beyond signing open letters, as many of them are directing their research toward activities that enhance the reliability, explainability, and safety of various AI systems.

Various groups and individuals, including non-governmental organizations, religious leaders, and academics, have voiced their support for international advocacy efforts aimed at limiting the development and use of autonomous weapons. The two most prominent groups in this regard are the International Campaign for Robot Arms Control, established in 2009, and the Campaign to Stop Killer Robots, a coalition formed in 2013. These groups have published reports and organized events with the goal of mobilizing nation-states, industry, and the public to advocate for a comprehensive ban on fully autonomous weapons. They are concerned about the ethical and legal risks associated with military AI systems, which we will explore in the risk taxonomy below.

Religious and cultural leaders have also expressed their views on the ethics of AI and, in some cases, supported bans or regulatory controls. For example, in 2014, an interfaith declaration advocating a ban on autonomous weapons was signed by numerous religious leaders, including Archbishop Desmond Tutu. The Dalai Lama and other Nobel Peace laureates have also endorsed declarations calling for a preemptive ban on lethal autonomous weapons, which they view as a "new form of inhumane warfare." The Holy See, the sovereign entity of the Catholic Church, has produced a paper on autonomous weapons, asserting that "it is fundamentally immoral to utilize a weapon the behavior of which we cannot completely control."

Assessing the success of these efforts at garnering public support is premature. Unlike bans on landmines and chemical weapons, which were driven by the graphic evidence of humanitarian harm, there are no actual instances of fully autonomous weapon systems being used in atrocities. However, science fiction narratives have already generated powerful images that invoke fear, and advocacy groups regularly reference these narratives to support their efforts.

6. Potential solutions to address the risks and challenges associated with AI in military operations

6.1 Human in the Loop

When a human is part of the AI system's loop, they can ensure that the system complies with relevant laws and rules of engagement and can be held accountable for the system's actions if it deviates from these standards. Additionally, the human can serve as the moral compass responsible

for upholding human dignity and as a source of emotions guiding humane behavior. While humans are not immune to errors, they tend to make different types of mistakes compared to autonomous systems. Likewise, although humans can be compromised, the methods and vulnerabilities they face are distinct from those of computer systems. Therefore, humans can provide an additional layer of oversight to support the responsible deployment and use of autonomous systems.
However, in certain military applications, there may be an incentive to transition humans to positions in the loop. For example, in defensive systems that need to respond swiftly to incoming threats, requiring human authorization for every engagement could slow down the system and undermine its ability to counter threats effectively. Particularly in scenarios where adversaries employ their own high-speed AI systems, human-in-the-loop approaches risk placing the side using them at a competitive disadvantage. In such cases, there is pressure to position human operators as monitors of the systems, ensuring that intervention remains a possibility.

While the loop concept provides a framework for risk mitigation, it has limitations. Firstly, the loop concept is most applicable to autonomous weapon systems that select and engage targets. Moreover, the loop concept does not cover human involvement in other phases of the system life cycle, such as robust testing and evaluation, weapons review, and other critical steps for risk mitigation. Additionally, there are challenges in interpreting the size and scope of the relevant loop. For systems capable of maintaining a presence over time or loitering and conducting multiple strikes, a human authorizing the initial deployment might still be considered in the loop, even as the system carries out various actions over extended periods.

6.2 Meaningful Human Control and Appropriate Human Judgment

Another concept aimed at mitigating risks by delineating the role of human involvement in autonomous systems is meaningful human control. This concept emphasizes that humans must have substantial moral, legal, and operational authority over AI systems through the exercise of control. Scholars like Heather Roff and Richard Moyes argue that meaningful human control should be integral throughout a system's development and deployment life cycle. This includes its design, development, training before conflicts (ante bellum), as well as human control during engagements and establishing accountability structures after conflicts (post bellum).

The U.S. Department of Defense (DoD) has highlighted a different concept, that of appropriate human judgment. Directive 3000.09 stipulates that "autonomous and semi-autonomous weapon systems shall be designed to allow commanders and operators to exercise appropriate levels of human judgment over the use of force." The U.S. delegation to the 2016 UN Convention on Certain Conventional Weapons (CCW) Informal Meeting of Experts expressed a preference for this term over meaningful human control because the latter was considered subjective and harder to define. They argued that "appropriate human judgment" better captures the significance of the human-machine relationship throughout a system's development and deployment and isn't limited to a moment when a decision is made to engage a target. However, the concept of appropriate judgment remains somewhat undefined, and further clarification is needed.

5. Conclusion

AI technology has already initiated substantial changes in the military domain, and its influence is expected to grow even more pronounced in the future. This paper concludes by emphasizing that advances in artificial intelligence have propelled autonomy beyond a crucial turning point. Embracing this evolving technology promptly and adapting policies to accommodate the rapid, successive changes, particularly in the defense sector, is now imperative.

With the recognition of AI's paramount significance, a global competition for leadership in the field is already underway. The path forward is challenging, encompassing tasks ranging from adopting a forward-thinking approach, formulating policies and roadmaps, nurturing AI software expertise, establishing a hardware industry base, and incentivizing entrepreneurs to invest in AI software and hardware development. Progress is underway, but a substantial effort is required to achieve the necessary momentum.

Future war scenarios are expected to deviate significantly from past patterns, with a reduced likelihood of full-scale or even limited wars. Warfare is likely to be hybrid, multi-domain, and multi-dimensional, involving limited military action but an increased focus on non-kinetic measures. The anticipated nebulous warfare of the future will be profoundly technology-driven. However, nations cannot disregard the possibility of a major military conflict and must maintain credible military preparations.

AI technology will play a central role in managing and controlling systems in non-kinetic, hybrid, or major military conflicts. Major powers worldwide must fully embrace AI within the next decade or two, or face potential repercussions.

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