

ARTIFICIAL INTELLIGENCE AND NATIONAL SECURITY: TRANSFORMATIVE IMPLICATIONS AND EMERGING CHALLENGES

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(Views expressed in the brief are those of the author, and do not represent those of ISSI)



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With the emergence of artificial intelligence (AI), conventional warfare strategies have transformed, and traditional military tactics utilized in national defence globally have evolved with the addition of a new AI-based technological layer.¹ This layer has expanding capabilities that are becoming increasingly important for applications in emerging technologies like cybersecurity, autonomous weapon systems, supply chain management, robotics, and real-time data processing. Military institutions are utilizing AI to enhance technological performance, boost defence system effectiveness, and enhance decision-making.² However, this advancement presents additional challenges, particularly in the context of nuclear deterrent systems.³ The ambivalent nature of AI and its potential as a force multiplier and a force of disruption underlines the critical importance of responsible deployment and development. The impact of AI on military strategy is

1 Daniel Araya and Meg King, "The Impact of Artificial Intelligence on Military Defence and Security," *Centre for International Governance Innovation*, March 2022, <https://www.cigionline.org/static/documents/no.263.pdf>.

2 Zachary Davis, "Artificial Intelligence on the Battlefield: Implications for Deterrence and Surprise," *PRISM* 8, no. 2 (2019): 114–31.

3 Vladislav Chernavskikh, "Nuclear Weapons and Artificial Intelligence: Technological Promises and Practical Realities" (Stockholm International Peace Research Institute, September 24, 2024), <https://doi.org/10.55163/VBQX6088>.

critical and has raised considerable concerns regarding the future of warfare and global security and stability.

The Rise of Artificial Intelligence in Military Operations

Multiple AI applications have already transformed conventional military operations by introducing new technologies, big data, and computing, eliminating the human element and increasing reliance on machines. One of the most well-known applications of AI is the utilization of autonomous and semi-autonomous systems. Modern drone technologies and ground robots are capable of conducting tasks that previously required human inputs, which includes targeting, intelligence, surveillance, and reconnaissance (ISR).⁴ The efficacy and accuracy of these technologies have drastically minimized the involvement of humans, and the operational costs associated with them. Drones, for instance, can transmit real-time data to military headquarters during surveillance of vast regions, making targeting, surveillance, and intelligence more accurate and faster than before. The enhanced level of automation in these systems enables them to provide a substantial number of tactical advantages, with more rapid and sophisticated response to emerging threats. AI's capacity to assess big data analytics has transformed the traditional means for making decisions in military operations.⁵ This data from drones, satellites, and sensors enables immediate identification of possible risks and detection of any abnormalities. It also provides early warning systems which can help to respond proactively rather than reactively. In addition to obtaining information, AI assists in operational planning by evaluating environmental factors such as weather patterns, which may affect military deployments and strategy.

In the context of cybersecurity, AI is actively developing novel tools to protect critical infrastructure from cyberattacks and intrusions. Machine learning algorithms can detect and respond to malicious activity patterns significantly faster than human operators, due to their autonomous operation and ability to mitigate cyberattacks. Similarly, predictive maintenance is another basic application of AI that guarantees the efficient operation of armaments and equipment by anticipating potential malfunctions, thereby minimizing delays and optimizing resource utilization. Additionally, AI also incorporates the 'Observe, Orient, Decide, Act' (OODA) loop, which is often used in military strategies to lay out the cycle of action in order to enhance the speed of decision-making.⁶ Real-time

⁴ Adib Bin Rashid et al., "Artificial Intelligence in the Military: An Overview of the Capabilities, Applications, and Challenges," *International Journal of Intelligent Systems* 2023, no. 1 (November 6, 2023): 8676366, <https://doi.org/10.1155/2023/8676366>.

⁵ Rashid et al.

⁶ Owen Daniels, "Speeding up the Ooda Loop with Ai - Joint Air Power Competence Centre," May 2021, <https://www.japcc.org/essays/speeding-up-the-ooda-loop-with-ai/>.

data processing in kinetic combat offers military forces a competitive advantage in modern warfare, as the pace of data processing is typically the determining factor in combat victory.

The Challenges of AI Integration into Nuclear Deterrence

Regardless of AI's various benefits in military operations, its utilization and integration in nuclear command and control frameworks pose serious concerns.⁷ When autonomy of critical decisions has been given to machines, the probability of misinterpretations and inaccurate alerts increases. The autonomy of AI allows it to operate without adequate human supervision, and any malfunction in the system or an error in threat assessment could lead to catastrophic outcomes. Despite their design to improve precision, these systems are still susceptible to malicious interference and errors. AI has expanded its role in nuclear deterrence from missile development and deployment to missile defence systems. However, as AI systems become more complex, they also become more vulnerable; for example, autonomous targeting may fail to identify legitimate targets or distinguish between false alarms and can never be capable of distinguishing between military and nonmilitary targets.⁸ Especially in critical circumstances that involve the use of nuclear weaponization, such malfunctions can be responsible for unintentional escalation.

Furthermore, one state's advancement in AI capabilities could pose a threat to another, potentially sparking a new arms race to acquire more advanced weaponry.⁹ These dynamics of a potential arms race can disturb global strategic stability by enhancing the probability of conflict and by creating a direct division between technologically developed states (primarily western world) and other developing states (also known as global south). Moreover, the growing dependence on AI systems raises questions about the accuracy and reliability of nuclear decision-making data. As the AI systems are dependent on big data analytics, which help them to operate efficiently, the consequences of corrupting or manipulating the datasets could be catastrophic. Unintentional acts might be triggered by using AI system flaws to undermine nuclear command-and-control systems. The preservation of the security measures for any military AI applications is paramount because data can be manipulated, and applications can be subjected to adversarial attacks.

⁷ Chernavskikh, "Nuclear Weapons and Artificial Intelligence: Technological Promises and Practical Realities."

⁸ Robert Sparrow, "Robots and Respect: Assessing the Case Against Autonomous Weapon Systems," *Ethics & International Affairs* 30, no. 1 (March 10, 2016): 93–116, <https://doi.org/10.1017/S0892679415000647>.

⁹ James Johnson, "Artificial Intelligence: A Threat to Strategic Stability," *Strategic Studies Quarterly* 14, no. 1 (2020): 16–39.

Harnessing the Potential of AI While Managing Its Risks

The implications of AI for national security are far-reaching and extend beyond nuclear deterrence. According to the UNDIR *AI and International Security report* “The use of AI can be a risk multiplier as it can introduce new risks of escalation and tensions, particularly as the capabilities are being developed and brandished in a context of intense inter-State competition, and as a matter of urgent priority for national security”.¹⁰ The vulnerability of nations to espionage is a significant security risk that could result from dependence on foreign AI technologies. Therefore, it is imperative to guarantee national sovereignty and strategic autonomy by ensuring self-reliance in AI capabilities. States must prioritize domestic AI research and development and work on developing indigenous AI capabilities, which will ensure their control over sensitive data and critical military technologies. Similarly, while real-time data processing ensures efficient and effective resource utilization, it also empowers military forces to make more informed and swift decisions. On the other hand, the swift decision-making capabilities of AI also introduce the risk of miscalculations, particularly during periods of crisis. ‘Human-in-the-loop’ remains crucial in preventing AI systems from exacerbating conflicts in high-pressure situations, especially in areas like nuclear deterrence and command-and-control.¹¹

Moreover, prioritizing ethical considerations, forming national AI policies and regulatory frameworks governing military, AI can guarantee that AI systems remain reliable and accountable in this modern world. In order to lessen these associated risks Pakistan has formally proposed establishment of international norms and guidelines for the ethical use of AI in military applications while drafting its national AI policy - 2023.¹² The policy “aims to go beyond the meagre approach of adopting technology to fundamentally rethink AI adoption and guiding investment in AI research and development, ensuring ethical and responsible use of AI, and provide a framework for addressing the challenges and risks associated.” Pakistan has emphasized the importance of ‘human in loop’ into critical AI decision-making processes and called for multilateral discussion to address the potential misuse of AI. Similarly, in the working paper presented by Pakistan at the Conference on Disarmament in July 2023, titled “Security and Stability Implications of Military Applications of Artificial Intelligence (AI), and Autonomy in Weapon Systems,” it was stated that “there are growing

¹⁰ Ioana Puscas, “AI and International Security,” project on Confidence-Building Measures for Artificial Intelligence (UNDIR, 2023), https://unidir.org/wp-content/uploads/2023/10/UNIDIR_AI-international-security-understanding_risks_paving_the_path_for_confidence_building_measures.pdf.

¹¹ Dawn Stover, “Keeping Humans in the Loop Is Not Enough to Make AI Safe for Nuclear Weapons,” *Bulletin of the Atomic Scientists* (blog), February 16, 2023, <https://thebulletin.org/2023/02/keeping-humans-in-the-loop-is-not-enough-to-make-ai-safe-for-nuclear-weapons/>.

¹² “National Artificial Intelligence Policy” (Ministry of Information Technology & Telecommunication, Government of Pakistan, July 2023), <https://moitt.gov.pk/SiteImage/Misc/files/National%20AI%20Policy%20Consultation%20Draft%20V1.pdf>.

concerns over the absence of global normative and legal guardrails to regulate the weaponization of these new technologies that carry far-reaching security and stability ramifications at the regional as well as international levels.”¹³

At international level the regulation of the use of AI for military applications requires the cooperation of the international community. The global dialogue can enhance transparency and confidence-building measures that will be beneficial in reducing the probability of unanticipated escalation and miscalculations. At the international level ongoing debates at the Conference on the Disarmament¹⁴ which focuses on Comprehensive programme of disarmament, Transparency in armaments and initiatives like UN Group of Governmental Experts (GGE) on Lethal Autonomous Weapons Systems (LAWS)¹⁵, shows a growing recognition of the need for regulatory frameworks. Such initiatives can help in regulating the development and deployment of AI-powered weapons, which will promote stability in a rapidly evolving technological environment. The use of AI in military and nuclear contexts is indicative of a new paradigm shift in states' approaches towards their defence and security. Besides transformative benefits of AI, its capacity to exacerbate security dilemmas and undermine conventional deterrence frameworks cannot be ignored. A comprehensive approach, involving international cooperation, responsible development, and the adoption of proactive measures to address the obstacles associated with AI integration in military frameworks, is necessary to balance the risks and benefits of AI. States can lessen the likelihood of destabilization while enhancing their national security by ensuring accountability and collaborating with the global community to address the challenges posed by the militarization of AI.

¹³ Permanent Mission of the Islamic Republic of Pakistan, “Addressing the Security and Stability Implications of Military Applications of Artificial Intelligence (AI), and Autonomy in Weapon Systems” (Conference on Disarmament, Geneva: United Nations Office for Disarmament Affairs, 2023), <https://documents.un.org/doc/undoc/gen/g23/152/33/pdf/g2315233.pdf>.

¹⁴ “Conference on Disarmament – UNODA,” February 25, 2019, <https://disarmament.unoda.org/conference-on-disarmament/>.

¹⁵ “Convention on Certain Conventional Weapons - Group of Governmental Experts on Lethal Autonomous Weapons Systems (2021) | United Nations,” 2021, <https://meetings.unoda.org/ccw/convention-certain-conventional-weapons-seventh-group-governmental-experts-2021>.