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Militarization of Artificial Intelligence and Implications for the Global Security – A Strategic Theory Perspective

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Abstract

Artificial intelligence is quoted as the revolutionary development that attracted the attention of a diverse range of domains. It is considered as the general-purpose technology that experts integrated with their respective domains. Likewise, militaries attempted to militarize the artificial intelligence in order to score relative gains in contrast to other states. Military application of artificial intelligence evolves warfare; introduces autonomous weapons; optimizes logistics; and enable AI technologies in intelligence, surveillance, reconnaissance and trainings. The implications of militarization of artificial intelligence are multifaceted and highlights risks associated with it. The risks involve arms race, ethical concerns, accidental conflicts, and influence of commercial companies in the defense sector. Strategic theory has been taken as a theoretical framework to comprehensively understand the research problem. Strategic theory is proposed as the comprehensive approach providing holistic thinking to the defense communities regarding the management of state's resources in the pursuit of achieving policy ends. The militarization of artificial intelligence takes into account the advance technologies of AI and integrate them with the military domain to score advantage in the battlefield. Militaries are investing state resources in such a manner that integrate artificial intelligence with the military domain to score superiority among great powers.

Keywords: Artificial Intelligence, Global Security, Lethal Autonomous Weapon System, Militarization, Strategic Theory.



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Introduction

Artificial intelligence is considered as one of the revolutionary developments of contemporary world impacting a diverse range of domains. The militarization of artificial intelligence poses severe implications for the global security. Warfare is continuously evolving that influences military strategists to incorporate artificial intelligence as the potential tool to advance competing national interest. The security analysts termed it as the matter of serious concern for the global security amidst the changing world order. The contemporary arms race depicts the militarization of artificial intelligence as one of the main tenets of the military security of great powers. Analyzing the current military developments, one can argue that synchronization of artificial intelligence with military tools is considered as the fundamental element of warfare. Military officials opine artificial intelligence as the defining element in order to maintain supremacy in the domain of security.

Artificial intelligence engages a large number of population one way or other. In 2024, smartphone users stand at 4.88 billion which accounts to the 60.42 % of the world population (Grabon, 2024). According to the ITU, there were more than 8.5 billion mobile phone subscriptions in use worldwide in 2022 that reflects more subscriptions as compared to world population at that time (Richter, 2023). Without an iota of doubt, a large faction of population interacts through social media in the era of globalization. The twenty-first century is, therefore, considered as more informed since the dawn of human history.

The globalized world connects billions of diverse people in the multiple spheres resulting into a bulk of diverse nature of output. In this global village, every single person views the world with a distinctive perspective. Cognitive domain is evolving with the passage of seconds owing to the dynamic nature of content which impacts discourse at multiple levels. The information that was only available to specific community (decision-makers) is now open to public as democracies legislated for right to information (for example, Article 19-A [Right to information] of the 1973 Constitution of the Islamic Republic of Pakistan) in order to ensure access to information for transparency. Hence, advent of artificial intelligence is considered as a turning point in the history of sapiens.

States have been utilizing resources in this regard to credit relative benefit in contrast to other states particularly opponent states or their allied states. It engenders the sense of insecurity among other states, which adversely impacts the global security. The synchronization of artificial intelligence in the military domain raises questions over the limitations and ethical considerations as well. The cognitive domain, the central element of artificial intelligence, is targeted through information tools that created a complex web of diverse perceptions that challenged the global security. At global level, large number of states and non-state actors are competing in order to secure an upper edge over the sophisticated technology for various motives. War is registered as one the defining features of history present in every era with varying technologies. Hence, warfare demands the integration of latest technology of its era. By following this analogy, statesmen attempts to integrate artificial intelligence in the military security to score maximum advantage in their favor (Csernaton, 2024).

The broader agenda of security is established in the book “Security: A New Framework for Analysis” authored by Barry Buzan, Jaap de Wilde, and Ole Wæver. They opine that security is not only confine to the combatants in the traditional military domain but also involves non-combatants in the non-traditional domains of security. They discussed a wide range of security domains that impact state’s security in one way or another (Buzan, Wæver, & Wilde, 1998).

Artificial intelligence is the defining feature of today's world that enveloped the all domains of security.

A diverse range of developments in the information and communication technology has widened the scope of global security. It involves various domains and targets of warfare. Security analysts quote current warfare technology synchronized with the advanced technologies associated with artificial intelligence in one way or another. The ever-changing warfare tends to incorporate contemporary technology at operational and tactical levels to achieve political objectives of state. Contemporary military strategists opine militarization of artificial intelligence as a turning point owing to their deep-rooted implications for global security that last for longer times. The vulnerable domains of society are attempted to exploit with the militarization of artificial intelligence (Rajagopalan & Patil, 2024).

Research Questions

This study tries to find out the answer of the following questions:

1. How integration of artificial intelligence in military leads to the militarization of artificial intelligence?
2. What are the implications of militarization of artificial intelligence for the global security?

Theoretical Framework

Theoretical framework offers a particular dimension to the research problem as it evaluates concepts from a particular perspective. Importance of theory in research lies in its foundational nature of analyzing concepts, events, developments, conflicts and various other associated things of concerning field in a particular perspective, termed as theoretical lens of theory. Researcher has taken Strategic Theory as the theoretical framework in this study to have a comprehensive understanding about research problem. Strategic theory guides decision makers in the utilization of resources to entertain the state national interest or achieve policies at the maximum level. In strategic theory, no universal formula exist which explains, describes or predicts the strategy and its output, rather strategy underscores huge variation with time regarding the selection of resources, tactics and operations (Gray, 1999).

Strategic theory proposes the idea of utilizing state resources to achieve policies. The state's political ends are framed by the political elite. The strategist attempts to achieve those political ends by utilizing the available resources of state in an efficient manner. In terms of resources, every state has limited choices to utilize in order to achieve policy objectives. Strategic theory accepts all possible resources in the state's account whereas it allows the members of the military profession and the interagency community to communicate intelligently concerning strategy. Therefore, strategic theory is outlined as the bridge that connects resources with policy ends (Popescu, 2009).

Political ends of states are competitive in nature owing to the international framework wherein states prioritize their national interests at the expense of other states. In this view, strategic theory proposes the idea of efficient utilization of state resources in order to achieve policy ends. Militarization of artificial intelligence attempts to employs state's resources in the domain of artificial intelligence to integrate advance technology with the diverse range of warfare in order to achieve the national interest of state (Yarger, 2006).

In theoretical framework, Strategic Theory has been taken as a lens in study while militarization of artificial intelligence is taken as a phenomenon that attempts to evolve warfare. Generally, the term strategy can be summarized as the use of means in specific ways to achieve the desired ends.

It can also be declared as a link between policy and military. Strategic theory, as a comprehensive approach, lies at the nexus of all dimensions of warfare providing a holistic thinking to the defense communities regarding the management of complexities of using force to achieve policy ends. Clausewitz stated that, “strategy is the use of the engagements for the purpose of the war, explore as a link between policy and military” (Gray, *The Strategy Bridge: Theory for Practice*, 2010).

A major segment of strategists termed militarization of artificial intelligence as a method to achieve political end-state after a wide mobilization of state’s resources. Advanced technology, artificial intelligence, is primarily remained the priority of state under this framework. Strategic thought fundamentals do not change by time as it proposes that warfare is context-dependent and tactical level can take infinite forms on the continuum of hybridity. War evolves in the form of continuous adaptation in character in every age. Based on these assumptions, Clausewitz stated that war is “more than a chameleon”. There are possibilities that enemy, friendly forces or the environment can take different forms (Caliskan, 2019).

Militarization of artificial intelligence

Artificial intelligence is a general-purpose enabling technology that functions in a diverse range of sectors through the processes of integration. Militarization of artificial intelligence is identified as the integration of artificial intelligence with warfare. Strategists intend to incorporate advance technology with the war tools for seeking victory in the wars. To pursue these goals, states are investing their resources in artificial intelligence-based war tools. In this scenario, artificial intelligence has been quoted as the advanced technology ever in the human history today. It improves the existing military apparatus and facilitates human resources through autonomous decision-making. Therefore, strategists termed the usage of artificial intelligence as inevitable to score relative gain over the other states.

Following section discusses the key applications of artificial intelligence in military and defense contexts.

Evolving character of war

The militarization of artificial intelligence has evolved the character of war. Warfare witnesses a profound impact on military organization and combat philosophy. Artificial intelligence has reformed military organizations by changing the distribution of machine and human resources. The changed distribution has also revolutionized the interaction among military’s human and machinery resources in war and war-adjacent operation. The current developments have delegated the drudgery task to artificial intelligence and provided human resources with space to prioritize things that really matters. The military application of artificial intelligence has also intensified the speed of operations. The undertaken aspect of evolving character of warfare is heavily impacted owing to the paradox nature of decision-making owing to this development. The element of speed has increased and decreased the timeline for decision-making. The militarization of artificial intelligence, therefore, evolves the character of war owing to revolutionary changes in combat philosophy, military organization, speed, and nature of interaction among machinery and human resources (Spindel, 2019).

Intelligent Weapon System

The integration of artificial intelligence has revolutionized the warfare through multiple features. It has enhanced the autonomy, precision, and decision-making capabilities of weapon system. In this system, machine learning, real-time data analysis, and neural networks have been considered as the significant technologies. These systems enhance the performance of military tools across

diverse range of domains. Some of the key features of AI integrated Intelligent Weapon System include autonomy, target recognition, real-time data processing, enhanced precision, threat prediction. Application of this system practically manifested in drones, unmanned vehicles, missile defense systems, cyber warfare, logistics and supply chain. In future, officials view the integration of artificial intelligence with quantum computing to score unparalleled computational power. Moreover, swarm technology and autonomous coordination are also aspired by the military experts. In a nutshell, the collaboration of artificial intelligence and human resource optimize the decision-making frameworks (Rashid, 2023).

AI-enabled simulation and training

Militarization of artificial intelligence transforms military preparedness through providing realistic virtual training environments to commanders and soldiers in order to learn, practice and optimize their preparedness. It offers realistic, efficient, and adaptive scenarios to the human resource of military organizations. With the integration of artificial intelligence in military, trainers simulate the complex scenarios of battlefields and evaluate performance for better decision-making. In this case, defense observers view the application of artificial intelligence in drones training, cyber warfare, command training and adaptive scenarios. More importantly, it powers immersive simulations by utilizing Augmented Reality (AR) and Virtual Reality (VR). With this, combats can engage in practicing battlefield scenarios, without any physical danger, with the help of artificial intelligence wherein they were provided with realistic and digitally customizable environments. This system is safe, adaptive and efficient coupled with large scalability and provide real-time feedback. A range of advance militaries particularly China, India, Russia, and US are working on this pattern to train their forces, autonomous weapons, cyber structure and strategic planners (Scharre, 2019).

AI-Driven Intelligence, Surveillance and Reconnaissance (ISR)

Intelligence, Surveillance and Reconnaissance (ISR) includes gathering, analyzing, and distributing data in order to achieve the situational awareness for decision-making. Militarization of artificial intelligence incorporates technologies of artificial intelligence with Intelligence, Surveillance and Reconnaissance to score enhancement in terms of accuracy, speed, and efficiency of intelligence gathering and analysis. The military application of artificial intelligence includes the analysis of the limits of imagination. AI-based Intelligence, Surveillance and Reconnaissance (ISR) improves the task of data processing through automated data collection, anomaly detection, predictive analysis, pattern recognition, target tracking and hybrid human-machine model. The applications include battlefield awareness, counter-terrorism, border security, urban warfare, and maritime surveillance. Typical examples include Chinese GJ-11 Stealth Drone, Israeli Heron TP, US Project Maven and US MNC Northrop Grumman's Global Hawk Drone. Artificial intelligence in Intelligence, Surveillance and Reconnaissance (ISR) guarantees swift decision-making, reduces errors, ensures operational efficiency, and promotes situational awareness (Jalil, 2024).

Lethal Autonomous Weapon Systems

Lethal autonomous weapon systems (LAWS) are the product of militarization of artificial intelligence. Military organizations are heavily investing in this domain to score advancement in the smart military technologies. The laws are defined as a distinct category of ammunition wherein sensor suites and algorithms are used in coordination in order to identify the target; employ onboard framework; and automatically attack the target in the absence of human controls. These sorts of weaponry systems are not yet developed at the widespread level but opined that they would incorporate artificial intelligence in the specific military operations wherein traditional systems

might not be capable to function. LAWS, sometimes referred as killer robots, can operate on water, on land, in air, or even underwater. These are applied in surveillance, military operations and urban warfare containing the features of autonomy, lethality, programmability and algorithms cum sensors. Examples include Harop by Israel, X-47B by USA, Kargu-2 by Turkey, Kalashnikov Group's AI-Assisted Drones by Russia and Drone Swarms by a range of military organizations (CCW, 2023).

Logistics optimization

The integration of artificial intelligence in military logistics is considered as the game changer development that attempts to advance faster, reliable and smarter operations. Artificial intelligence, as a general-purpose technology, has optimized the supply chain and logistics in multiple domains. In case of militarization of artificial intelligence, defense analysts opine the optimization of movement of defense equipment, troops, and military supplies. It reduces the costs; enhances efficiency, promotes operational readiness; and guarantees supply chain management. The integration of artificial intelligence in military supplies not only benefit in combat but also holds significance in peacetime. In practical terms, it involves predictive maintenance, supply chain management, route optimizing, autonomous vehicles, disaster readiness, and inventory management. Advantages of artificial intelligence in military logistics include speed, efficiency, accuracy, and reduces cost and risk factors as well. Military experts view the prospects of artificial intelligence in swarm technology, global positioning system, blockchain management and their utility in logistics to optimize movement of forces, equipment, and defense supplies (Hellmuth-Sander, 2024).

Implications for global security

The implications of militarization of artificial intelligence covers multiple dimensions in unprecedented depth and breadth. Officials are outlining policies for militarizing the tools of artificial intelligence and legislating for defend against the perils of emerging technology. The entry of robotics in the military tools has exacerbated the ethical concerns raised by the global population. In addition, mechanical and technical errors are registered as the potential threat to globe. The discourse of global security community reflects a mix of perceptions to interpret militarization of artificial intelligence and implications for global security. The military application of artificial intelligence attempts to change the defense policies of states in a more radical manner. It revolutionized the patterns of global security and exacerbated the scope of conflicts as well. Hence, military application of artificial intelligence underscores a complex set of implication for global security that demands the serious attention of policy makers and practitioners to counter the emerging threats to global security.

Following section attempts to highlight the implications of militarization of artificial intelligence for global security.

Arms race

The militarization of artificial intelligence has raised serious concerns regarding a new arms race among advanced militaries of the world. States are integrating artificial intelligence into their defense sector in order to score relative gains over other states. This pattern has exacerbated the competition among major global powers, which has raised the danger of severe implications in terms of military security. The increased investment in militarization of artificial intelligence leads to the development of AI-dominated generation of warfare involving LAWS, cyber war tools, and AI-enabled surveillance systems. The emergence of arm race in the militarization of artificial intelligence also impacted human security in a more radical manner. Risks of laws increasingly

pointed out by the defense analysts owing to lack of human control, accountability complexities, and hacking of AI algorithms. Regulatory mechanism of AI-based weaponry is unclear and complex in nature that sparks concerns of the security observers. The emerging patterns of military application of artificial intelligence is destabilizing the established order among states that could lead to catastrophic outcomes (CACDA, 2019).

Shifting of world order

Artificial intelligence is taking lead in terms of domains where competition among great powers decides the fate of world order. Analogous to cold war's nuclear and space races, sapiens are witnessing another tug of war among multiple powers. The shifting of global world order manifests the leading role of East-Asian region coupled with the notion of Indo-Pacific as the hub of transactions. These nations are taking lead in the domain of artificial intelligence as well. In contrast to the western world, this region is not well integrated analogue to European Union. This deficiency might exacerbate the rise of nationalistic sentiments in the utilization of artificial intelligence in security framework. The typical example could be quoted as Korean peninsula bifurcated between North and South wings along with contrasting ideologies and burden of history. In the same geographical setting, South China Sea is another bone of contention in the pursuit of regional integration where China's emergence has played a mix of roles. China's approach towards artificial intelligence is not only technological but political as well. China's exploitation of information vulnerabilities in Taiwan depicts the strategists' priorities in terms of artificial intelligence. Role of other nations also exacerbated the severity of implications at regional levels. The AI-based arms race potentially destabilized the international security. Hence, advancement in Artificial Intelligence decides the shift in world order that encapsulates a bulk of implications globally (Humble, 2024).

Humanitarian and ethical concerns

The militarization of artificial intelligence has sparked a range of moral, ethical, legal and humanitarian concerns. These concerns reflect the vulnerable fault lines of new developments in the military domain. The military application of artificial intelligence could result into the loss of human control wherein autonomous weapon systems lead the decision-making in the absence of oversight by human resources. Furthermore, errors by the artificial intelligence raised legal concerns as who will be accountable for the civilian casualties. This dimension of the militarization of artificial intelligence raises questions over the unintended casualties of citizens by autonomous weapons system wherein complexities prevail while determining the responsibility for such huge losses. At societal level, ethical concerns are raised over the surveillance mechanism employed by artificial intelligence-based machinery. This element causes distrust in the society wherein fear exists regarding the misuse of information, data, and virtual resources. The psychological implications of the militarization of artificial intelligence are considered as organic owing to its moral, ethical, legal and humanitarian concerns (Sisson, 2019).

Role of commercial companies

Several commercial companies are involved in the projects that are based on the military application of artificial intelligence. Visual recognition and unmanned vehicles system are used in military and commercial application as a general-purpose technology. New technology is creating an emerging market that attracts the technological corporations. Commercial companies enable the supply of inputs in a diverse range of data, tools, theories and other critical elements involving satellite imagery, financial transactions, media patterns, social sites data, and traffics of air, sea, and internet. The United States' military-industrial complex is considered as one of the typical

examples wherein American technological giants realize the prospects of artificial intelligence and strive to invest their resources in the research and development of advance technology. IBM, Google, Microsoft, Oracle, Salesforce, Apple Amazon are advancing in this domain wherein some are also participating in the defense projects. These sorts of projects need supercomputers, recognition technology, data centers, and simulation systems to consider as fundamental components in the militarization of artificial intelligence. The US Defense Advanced Research Projects Agency plans to invest up to \$2 billion in artificial intelligence systems in 2019–2024. According to the United Nations, the United States has more than 1,900 satellites in orbit around the Earth. Therefore, role of commercial companies in the military domain holds a plethora of risks to global security. (Kozyulin, 2019).

Accidental conflicts

The militarization of artificial intelligence could lead to the misperceived or accidental escalation of conflicts. It refers to the scenarios wherein deployment of artificial intelligence in the military spheres triggers conflicts due to misinterpretation, errors, or unpredictable nature of machinery. As the artificial intelligence-based autonomous weapon system are out of human control, this dimension raises severe concerns regarding the fault lines of new technology. Accidental escalation could trigger due to misidentification of threats, autonomous decision-making, algorithmic errors, and cyberattacks. The malfunction, misinterpretation, and collision of autonomous weapon system sparks new conflict scenarios among nations. It engenders new regional and global conflicts coupled with a bulk of human casualties. Presence of frequent errors and mishaps derail the confidence building measures among rival states. In this particular scenario, defense experts raise concerns over the legal dimension as well. It questions the case of accountability that who will be responsible for accidental conflicts: commander, programmer, machine or any other entity. Accidental conflicts could potentially impact the nuclear deterrence among competing states and destabilize the nuclear stability at global level. Hence, vulnerable fault lines in artificial intelligence could lead to dire consequences and potentially destabilize the global security in one way or another (Scharre, 2019).

Conclusion

The militarization of artificial intelligence is considered as the significant development in the defense sector. It has revolutionized the warfare through multiple tools, methods, procedures and most importantly, autonomous weaponry. The integration of artificial intelligence with military resulted into lethal autonomous weapon system, evolving warfare, AI-enabled ISR, Logistics optimization, and AI-driven simulations and training. These changes underscore a diverse range of implications for the global security in one way or another. Ethical, moral, legal and humanitarian concerns are considered as the potential threats associated with the militarization of artificial intelligence. Accidental and misperceived conflicts are also quoted as one of the risks of military application of artificial intelligence wherein legal responsibility is also questioned by the military analysts. AI-based arms race is predicted as the potential risk could spark among great powers. Role of commercial companies in defense sector, due to their advancement in artificial intelligence, is another concern raised by defense experts. Militarization of artificial intelligence has revolutionized the military domain that poses diverse implication for the global security and demands serious policy measures to mitigate the risks associated with it.

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