

THE GLOBAL IMPACT OF AI-DRIVEN LETHAL AUTONOMOUS WEAPONS: STRATEGIC DYNAMICS AND POLICY CHALLENGES

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The application of modern technologies impacts various sectors, including social, economic, informational, political, and military domains. Their influence on daily life is increasingly significant. While these technologies offer many advantages to humanity, it is essential to acknowledge their dual-use nature and rapid integration into the defense sector. Lethal Autonomous Weapon Systems (LAWS), also referred to as killer robots, represent a prominent application of Artificial Intelligence (AI) and are considered effective for achieving military objectives. This has drawn attention to advancements in weaponization, sparking a global technological race. However, according to the United States Department of Defense, these weapons are capable of independently identifying and targeting without further human intervention to execute a specific action or series of actions they utilize computer programming, as well as the integration of actuators and sensors with their environment. If they require human assistance, they are not classified as fully autonomous.¹ The utilization of a fully autonomous mode in LAWS has not been implemented at present. Nonetheless, several factors have

¹ Adam Cook, "Lethal Autonomous Weapon Systems Terminology," *Taming Killer Robots* (Air University Islamabad Press, 2019), <https://www.jstor.org/stable/resrep32452.6>.

contributed to their rapid proliferation in conflict environments, such as significant competition in the development and deployment of these unmanned weapons.

The utmost important factor that contributed to the rapid proliferation is the mechanism of these weapons. Their mechanism comprises enhanced speed and endurance, precise targeting, facilitation of decision-making, assurance of mission success, operations in communication-degraded or denied environments, keeping human personnel away from the dangers of war, and reducing human stress. It remains unclear how the international community defines and utilizes this technology, but it is evident that developed states are actively pursuing research and development in this area.² Autonomous systems are classified into three sub-categories based on human participation.

- i. Human-in-the-loop Weapons: Human operators play an active role in each stage of the decision-making process. They are entrusted with receiving information, thorough analysis, and the ultimate determination regarding target engagement. The most effective example of a human-in-the-loop weapon is GPS-guided munitions to homing devices such as guided air-to-air missiles.
- ii. Human-on-the-Loop Weapons: The system functions autonomously but is subject to human supervision. The human operator is responsible for monitoring the actions of the autonomous system and holds the authority to intervene and override decisions when necessary. Such as Iron Dome of Israel and the Navy's Phalanx the U.S. Aegis-class ship, which provides defense against external threats by the involvement of humans.
- iii. Human-out-of-the-loop Weapons: The system operates autonomously without needing human intervention once activated. It is engineered to independently identify, evaluate, and engage targets based on predetermined parameters and algorithms. The presently operational loitering munition is the Harpy, produced by Israel. This antiradar weapon is engineered to locate and neutralize radar systems that meet its predetermined criteria within a specified target area.³

Globally, major powers are shifting their power dynamics into autonomous AI grounds and participating in acquiring these LAWS for their defensive and offensive purposes. The U.S., China, and Russia are leading in advancing their conventional weapons into semi and fully autonomous

² Ministry of National Defense and Romică Cernat, "Lethal Autonomous Weapon Systems – Emerging and Potentially Disruptive Technology," *Romanian Military Thinking*: 156–75, DOI: 10.55535/RMT.2022.4.08

³ Frank Sauer, "Lethal Autonomous Weapons Systems," (2021), 237-250, <https://doi.org/10.4324/9780429198533>.

systems with the help of AI-enabled technologies in all realms like ground, sea, air, space, and outer space.⁴

In 2012, Directive 3000.09 from the U.S. Defense Department (DoD) established policies and responsibilities regarding the advance and utilization of autonomous and semi-autonomous weapon systems. The primary objective of this directive is to ensure that the United States upholds the appropriate levels of human decision in application of force, while simultaneously harnessing the advantages of autonomy within weapon systems, it is not surprising that the U.S. is at the lead of the worldwide development of lethal AWS given that its defense budget surpasses that of China and Russia.⁵ Autonomy has been formally recognized as a pillar of the U.S. national security strategy.⁶ This doctrine was the first of its kind, permitting fully automated weapons to pick and involve targets with top-level DoD authorization and semi-autonomous systems to employ pre-selected targets by human operators. Moreover, the U.S. started manufacturing the Phalanx CIWS in 1978 and conducted its initial tests on the USS Coral Sea in 1980. Since 1978, the Phalanx has undergone continuous manufacturing enhancement and renovation.⁷

Despite lagging on various capacity and expertise indicators, Russia has taken a prominent position in the deadly AWS race. Russia freely wants to exclude people from decision-making processes and has no intention of adhering to international initiatives to limit or outlaw the use of AWS in warfare.⁸ Their self-contained robotic tank, the Uran-9, has already been sent to Syria.⁹ and Arena-M, Russian latest active protection system for T-90 and T-72 tanks, can shield bulletproof vehicles against United States Tube-launched optically Targeted wire-guided (TOW) missiles.¹⁰

China is leading the way in developing advanced Autonomous weapon systems and AI. It has stated in its “Next Generation Artificial Intelligence Development Plan” that it would use AI in conjunction

⁴ Justin K. and Danise Garcia, “The Artificial Intelligence Arms Race, trends and World Leaders in Autonomous Weapons Development,” *Global Policy*, <https://onlinelibrary.wiley.com/doi/10.1111/1758-5899.12713>

⁵ “300009p.Pdf,” accessed July 31, 2024, <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/300009p.PDF?ver=e0YrG458bVDI3-oyAOjOw%3d%3d>

⁶ Jim Mattis, “Summary of the 2018 National Defense Strategy,” <https://apps.dtic.mil/sti/pdfs/AD1045785.pdf>.

⁷ “Deputy Secretary: Third Offset Strategy Bolsters America’s Military Deterrence,” The United States DoD, accessed July 22, 2024, <https://www.defense.gov/News/News-Stories/Article/Article/991434/deputy-secretary-third-offset-strategy-bolsters-americas-military-deterrence/>

⁸ Billy Perigo, “A Global Arms Race for Killer Robots is Transforming Warfare,” *Time*, April 9, 2018, <https://time.com/5230567/killer-robots/>

⁹ Daniel Brown, “Russia’s Uran-9 Robot Tank Reportedly Performed in Syria,” *Business Insider*, accessed July 22, 2024, <https://www.businessinsider.com/russia-uran-9-robot-tank-what-can-it-do-syria-2018-5>.

¹⁰ “Russia to Equip T-80BVM and T-90M Tanks with Arena-M Active Protection,” accessed August 21, 2024, <https://armyrecognition.com/focus-analysis-conflicts/army/conflicts-in-the-world/russia-ukraine-war-2022/russia-to-equip-t-80bvm-and-t-90m-tanks-with-arena-m-active-protection-system>.

with AWS to fight on the battlefield. China has a significant capability for weapons development. Most remarkably, swarming technology has been assessed by Chinese businesses using over 1,000 synchronized drones.¹¹ China has advanced technologically in an unconventional way because of its contentious intellectual acquisition practices. China's State Council projects that its AI industry will be valued at US\$59 billion by 2025, and US\$150 billion by 2030, with significant investment in "civil-military fusion."¹²

From the South Asian regional perspective, adopting AI and automation-driven LAWS has become a prominent element of the state's strategic culture. India is a major example of a South Asian state that is continuously attempting the development and deployment of AI-powered military weapons, particularly LAWS. This effort is aligned with India's aspiration to become a significant regional power and its commitment to the U.S. as a "net security provider" To strengthen its maritime security it is strengthening its naval capabilities, conducting and participating in joint naval ventures, and assisting smaller coastal states in patrolling and surveillance. Furthermore, it has adopted modern capabilities like advanced drones, autonomous underwater vehicles, and unmanned surface vehicles.¹³ The Indian Defense Research and Development Organization (DRDO) also attempts to incorporate AI into naval operations and develop native autonomous weapons. India is also working with countries like the U.S., Israel, and France to develop and acquire cutting-edge maritime technologies and autonomous systems. Joint exercises with QUAD members and other allies aim to Improve the interoperability of autonomous systems. ¹⁴

Pakistan's stance on LAWS is based on the ethical premise that these autonomous systems are fundamentally unable to distinguish the combatants from the non-combatants, and therefore compliance with UN International Humanitarian Law (IHL) cannot be guaranteed. Because these systems cannot be held accountable for their actions, Pakistan says LAWS will "lower the threshold

11 "Chinese Scientists Create Swarming Drones," *South China Morning Post*, accessed August 21, 2024, <https://www.scmp.com/news/china/science/article/3255809/chinese-scientists-create-swarming-drones-can-rapidly-multiply-mid-air-create-tactical-shock>

12 Jeffrey Ding and Allan Dafoe, "Engines of Power: Electricity, AI, and General-Purpose, Military Transformations," *European Journal of Int: Security* 8, no. Aug 2, 2024: 377–94, <https://www.cambridge.org/core/journals/european-journal-of-international-security/article/engines-of-power-electricity-ai-and-generalpurpose-military-transformations/7999C41177B0C2A7084BD3C1EAC0E219>.

13 Sufian-Ullah and, Zeeshan Hayaat, "India as a Net Security Provider in Indo-Pacific and Implications for the Region," *Nust Journal* 4 (January 25, 2021): 26–39, https://www.researchgate.net/publication/348891591_India_as_a_Net_Security_Provider_in_Indo-Pacific_and_Implications_for_the_Region.

14 "India has Emerged as a Net Security Provider in Indo-Pacific, Says Raksha Mantri at Multi-Agency HADR Exercise 'Samanvay 2022' in Agra," accessed August 2, 2024, <https://drdo.gov.in/drdo/headquarter-directorates/information-technology-and-cyber-security>

of war” and eliminate accountability. Such weapon systems have the potential to endanger human lives while also undermining international personal protection laws.

The international community criticizes the debate on restricting and banning LAWS, arguing that power politics and national interests often override morality and IHL. India’s introduction of advanced autonomous technologies, such as unmanned surface and underwater vehicles, could spark a regional arms race. International efforts to contain and control the spread of LAWS have so far had little success. There is an urgent need to develop a new framework that considers the diffusion of these technologies. If left uncontrolled, these weapons could result in the hands of non-state actors, creating a situation that is difficult to control. To prevent an increase in their use, the international community must now prioritize the consideration and implementation of appropriate restrictions on the development of LAWS.