

AWS vs LAWS: A Policy Analysis of the Development and Use of Lethal Autonomous Weapons Systems in Combat

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Introduction

Over the past ten years, artificial intelligence (AI) has become an active part of everyday life. From online shopping to Google searches, AI has become an integral part of many of the mundane technologies people use daily. AI has also had a rapid, revolutionary impact on defence and security, becoming a fundamental part of warfare. It has transformed the way states pursue and defend their interests, helping with reconnaissance, command and control, and cyber/information operations. However, the emergence of lethal autonomous weapons systems (LAWS) has raised new concerns about the effectiveness, legality, and ethical ramifications of using AI in warfare.

This article examines the implications of using AI in warfare, particularly lethal autonomous weapons systems. It evaluates the impact of militarized AI on geopolitics and strategic communications, as well as the ethical ramifications of its use. It argues that while failing to develop this technology due to ethical concerns may create a security risk for Western states, rival powers such as Russia and China may continue to develop these technologies and deploy LAWS, exacerbating tensions and conflict between states and ultimately causing more harm than good. This research provides a path forward for Western lawmakers regarding the development and use of LAWS technology, advocating a hybrid approach of development and restraint that will ensure national safety while limiting the destabilizing effects this AI arms race may cause.

Context

Autonomous weapon systems (AWS) are military systems that can perform specific tasks, such as sensing or tracking, with some degree of independence from human operators (Taddeo & Blanchard, 2022). Broadly, there are three categories of AWS with varying levels of autonomy and human supervision: human-in-the-loop, human-on-the-loop, and human-out-of-the-loop. Human-in-the-loop systems require that humans authorize each action, such as confirming a target, before a system engages. On-the-loop means that humans supervise and can override decisions made by the autonomous system. Out-of-the-loop means that a system acts fully autonomously and without real-time human intervention (McFarland & Galliot, 2021). Currently, only human-in-the-loop and on-the-loop systems are utilized (Rickli & Mantellassi, 2023).

States have increased funding and resources to develop AI-enabled systems for several key reasons. Operationally, AI enhances the speed and accuracy of intelligence, surveillance, and reconnaissance tasks. It also aids complex decision-making by accelerating observe–orient–decide–act (OODA) loops (Simmons-Edler et al., 2025). Strategically, AI-powered systems can serve as force multipliers, operating in environments that are too risky or manpower-intensive and helping maintain technological advantages (Taddeo & Blanchard, 2022). This perspective sees AI instruments as the only way for humans to keep up with the accelerating pace of war, allowing weapons systems to make decisions more quickly and autonomously, faster than enemies, conferring strategic and tactical advantages (Rickli & Mantellassi, 2023). Furthermore, AI-enabled defence platforms reduce personnel risk and may potentially improve civilian protection by distinguishing targets more precisely (Miller, 2025).

However, the use of autonomous weapon systems also poses various concerns. Ethically and legally, delegating life-and-death decisions to machines raises questions about accountability, compliance with international humanitarian law, and the erosion of human dignity (McFarland & Galliot, 2021). These systems can also be unpredictable, as black-box decision-making, reward hacking, goal misgeneralization, and emergent behaviours undermine control and reliability (Simmons-Edler et al., 2025). Furthermore, autonomous weapons risk escalating arms races, lowering the threshold for conflict, and increasing proliferation, especially as AWS becomes more capable and widespread (Johnson, 2019).

Despite these challenges, AI is already deeply embedded in four core military domains.

Intelligence, Surveillance, and Reconnaissance (ISR). AI systems process vast quantities of sensor data (such as satellite and drone imagery), performing automated object detection, classification, and anomaly recognition. This enables real-time situational awareness and predictive threat analysis but may also risk bias or false positives (Simmons-Edler et al., 2025).

Command, Control, and Decision Support. AI augments human commanders by analyzing logistics, modeling risk, and proposing courses of action. This human–machine teaming accelerates decision-making but also creates challenges of trust, including overreliance on algorithms, or “automation bias,” that may lead operators to follow AI recommendations without critical reflection or pushback (Feldman et al., 2024).

Cyber and Information Operations. AI is used in both offensive and defensive cyber strategies, with machine learning enabling automated intrusion detection, adaptive defences, and targeted cyberattacks. Generative AI can also drive disinformation campaigns, deepfakes, and microtargeted

propaganda. However, this has raised serious concerns about attribution, escalation, and legal or regulatory accountability (Simmons-Edler et al., 2025).

Semi-autonomous Weapon Systems. Many deployed weapons remain semi-autonomous. AI may help with target tracking, threat identification, or flight control, but humans still retain final authority to engage. This includes munitions and defensive systems, such as close-in weapon systems (CIWS), that protect against short-range threats (Taddeo & Blanchard, 2022).

States have taken different approaches to developing or deploying AI-enabled autonomous weapons systems, but no country has claimed to utilize fully autonomous LAWS without human oversight. Major military powers such as the United States, Russia, China, and Israel are investing heavily in increasing their autonomous capabilities. They uphold that humans retain control over lethal decisions while simultaneously seeking to employ AWS via unmanned aerial vehicles, swarming technology, AI-enabled targeting, and decision-support systems (Bächle and Bareis, 2022; Taddeo and Blanchard, 2022). The United States governs these systems under the Department of Defense policies that require “appropriate levels of human judgement,” but China and Russia emphasize autonomy as a means of offsetting operational and strategic constraints (Simmons-Edler et al., 2025).

The ongoing conflicts in Ukraine and Palestine reveal how AI-enabled drones and semi-autonomous weapons systems are already shaping battlefield dynamics. Russia has developed unmanned ground robots with AI that can identify and engage with the enemy forces autonomously, while Ukraine has developed the Saker Scout that can independently recognize and share the coordinates of enemy equipment, enabling a reconnaissance-to-strike cycle so quick that some believe the system is already fully autonomous (Hwang, 2025; Kyiv Post, 2023). This has led many countries, particularly small or non-aligned states, to call for international restrictions on fully autonomous weapons. This desire reflects growing concern that continued development without governance may normalize autonomy in warfare and undermine accountability and civilian protection (Sanatoni de Sio et al., 2018).

LAWS vs. AWS

While AWS refers broadly to systems with autonomous capabilities, lethal autonomous weapon systems (LAWS) are a subset specifically designed to apply lethal force without human input (Taddeo & Blanchard, 2022; Wilcox, 2023). LAWS are considered human-out-of-the-loop weapons, allowing them to identify and attack targets without human intervention. This complete independence has raised many ethical concerns, as LAWS can eliminate life independent of human thought, emotion, or reasoning.

Legally, this autonomy also raises questions about who should be held accountable if the technology makes a mistake.

The distinction between AWS and LAWS has significant implications for governance. Not all regulations need to apply to all AWS. Instead, policies may specifically address LAWS due to their unique ethical, legal, and strategic risks (McFarland & Galliot, 2021).

From a policy perspective, safeguarding or governing LAWS can be divided into three categories.

Human Control and Oversight. To preserve accountability and legal compliance, policy frameworks can include requirements for meaningful human control. Going beyond superficial supervision, meaningful control means that humans should understand a system's logic, be able to intervene, and retain responsibility for use-of-force decisions (Bailey, 2024).

Technical Safety and Reliability Measures. Robust safeguards are needed throughout the system's lifecycle, including rigorous verification and validation, adversarially resilient training, explainable AI features, and fail-safe mechanisms such as self-deactivation or geofencing (Podr & Colign, 2025).

International Governance and Cooperation. Due to the global nature of military AI, international agreements are critical. Scholars advocate for arms-control-style treaties (bans or protocols on high-risk LAWS), transparency measures, export controls, and shared technical norms for safe design and testing (Simmons-Edler et al., 2025).

Policy Options for Governing LAWS

As artificial intelligence continues to evolve and become a central component of military strategy, lawmakers must decide what (if any) measures or restrictions must be imposed on lethal autonomous weapon systems. While there is consensus that some form of oversight is necessary, policymakers and experts disagree on what constitutes an appropriate balance between regulation, prohibition, and the continued development of LAWS. Three key approaches have emerged in response to this question: an outright ban on LAWS, necessitating some form of human control, and a hybrid approach that allows development while restricting their deployment and use.

1. Legally Binding Ban on LAWS.

One potential solution is adopting a legally binding international treaty that prohibits the development and deployment of LAWS. This would include any system capable of selecting and engaging targets without meaningful human intervention. Proponents of this approach claim that such systems pose unacceptable strategic, ethical, and legal risks by delegating life-or-death decisions to machines (Taddeo & Blanchard, 2022; Miller, 2025). Legal scholars also argue that International Humanitarian Law may be insufficient to address accountability gaps inherent in fully autonomous systems, especially in allocating responsibility for unlawful harm (Miller, 2025).

This dilemma could be overcome through a treaty that explicitly prohibits the development or deployment of “out-of-the-loop” LAWS, thereby reinforcing the principle of human agency in the use of lethal force.

Support for this option is strong among humanitarian organizations and ethicists who emphasize the risks LAWS pose to violent escalation, proliferation, and the erosion of human dignity (Bächle & Bareis, 2022). However, the feasibility of a comprehensive ban remains unknown. Major military powers have expressed concerns about enforcement, with definitional ambiguity and the dual-use nature of AI technologies posing significant challenges to verification and compliance (Simmons-Edler et al., 2025).

2. Regulation with Human Control Requirements.

An alternative option to a comprehensive ban would require states to maintain or implement meaningful human control over critical functions in weapons systems. In this approach, autonomous capabilities can still be utilized as long as humans retain authority over lethal decision-making, maintain situational awareness, and can intervene if necessary (Trabucco, 2021; van Diggelen et al., 2023). This option reflects existing national policies and supports the argument that AI can enhance military effectiveness without removing humans from the equation (Taddeo & Blanchard, 2022). Regulatory frameworks may include operational constraints, requirements for human-in-the-loop or human-on-the-loop control, or technical standards for testing or auditability.

Nevertheless, critics warn that any form of regulation may legitimize autonomous weapons systems while creating superficial safeguards. Scholars also emphasize that “meaningful” human control cannot be guaranteed by formal oversight alone, and that factors such as system speed, complexity, and transparency may, in practice, prevent effective human intervention (Feldman et al., 2024). Without clear thresholds and enforcement mechanisms, regulatory approaches risk being ineffective and inconsistently applied across states.

3. Hybrid Approach: Develop but do not Deploy Fully Autonomous LAWS.

The third option is a hybrid approach that permits the development and testing of autonomous weapon technologies but restricts or prohibits their operational deployment and use. This moratorium would allow states to pursue research for defensive preparedness, safety testing, and practical understanding while avoiding the imminent threats it may pose to warfare (Simmon-Edler et al., 2025). Proponents of this approach argue that it acknowledges strategic realities (including the likelihood that states will not halt their AI research entirely) while reducing incentives for rapid deployment and escalation (Bächle & Bareis, 2022). Furthermore, continued development could also support the creation of safety standards, verification methods, international governance, or confidence-building measures.

However, scholars warn that continuing to allow development may still fuel an arms race or normalize technological autonomy in warfare (Podar & Colijn, 2025). Without binding commitments, transparency requirements, or intentional monitoring, a hybrid approach risks covert deployment and uneven compliance, ultimately limiting its long-term effectiveness.

Policy Recommendation

Given the ethical risks, legal uncertainties, and strategic realities surrounding lethal autonomous weapon systems, the most pragmatic regulatory solution is a hybrid governance approach that permits the development and testing of autonomous military technologies while prohibiting/restricting their use in combat.

The key challenge in governing LAWS is the tension between ethical imperatives and military incentives. States are unlikely to halt their research and development of military AI due to concerns over deterrence, technological parity, and uncertainty about adversarial capabilities. A hybrid approach acknowledges these relationships by allowing continued research and testing while clearly defining normative and operational boundaries for its application. Continued development can also serve defensive and preventive purposes, including developing countermeasures or improving verification and monitoring mechanisms. Prohibiting use rather than research also reduces incentives for premature deployment driven by an arms-race dynamic, thereby exacerbating risk and unsafe system integration (Podar & Coljin, 2025).

Restricting the use of operations directly addresses the acute ethical concerns surrounding LAWS, namely the delegation of lethal decision-making to machines without meaningful human interaction. While development poses few moral risks, battlefield utilization raises concerns about accountability,

proportionality, and civilian harm. A non-use commitment preserves human responsibility in the use of force while still enabling states to explore AI capabilities under controlled conditions. A hybrid approach would also create space for engineers and policymakers to learn more about how autonomous technology reacts to challenges such as uncertainty, data bias, and dynamic environments. This knowledge is critical to informing future regulation and ensuring that AI-enabled military systems remain subject to human control.

Furthermore, a hybrid model can function as a confidence-building measure between states. By committing to non-deployment while maintaining transparency around development practices, states can increase trust and reduce the risk of escalation. This approach could be reinforced via information-sharing mechanisms or voluntary reporting. Informed regulation can emerge in tandem with AI capabilities, avoiding irreversible commitment while still constraining their most dangerous applications.

For a hybrid approach to be effective, it must be accompanied by precise policy instruments. This includes explicit prohibitions on the operation and use of fully autonomous weapons systems, transparency requirements for testing and deployment, and international dialogue on verification standards. Nevertheless, as an interim policy recommendation, this approach offers the most feasible yet ethically defensible pathway for governing LAWS within current legal frameworks and geopolitical conditions. It balances cautious realism with space for cooperation, ultimately prioritizing the use of human agencies in decisions about lethal force.

Conclusion

Artificial intelligence, specifically Lethal Autonomous Weapons Systems, has dramatically reshaped the way states conduct warfare. However, the operational advantages these technologies can offer are overshadowed by ethical, legal, and strategic concerns arising from the removal of human judgment from decisions about lethal force. Existing international humanitarian law alone is insufficient to address these challenges. A comprehensive ban on LAWS is morally defensible but politically impractical, while regulatory approaches grounded in human control requirements are vulnerable to inconsistent enforcement and ambiguity. A hybrid governance approach that allows development and testing but prohibits operational use offers a realistic yet ethically grounded path forward.

By continuing to develop LAWS while promoting safety research and international cooperation, the hybrid approach reduces escalation risks, preserves human accountability, and provides pathways toward future regulation. AI capabilities and their use in warfare will continue to advance, but adopting this model now can help prevent irreparable harm while maintaining flexibility in an uncertain technological and geopolitical landscape.

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