The Struggle Over Regulating Autonomous Weapons Systems

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On my honor as a university student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Over a century ago, “soldiers rode into World War I on horseback and left in tanks and airplanes” (O’Connell, 2017). Today, many soldiers wage war through computer screens with remote controls. Automation of warfare, however, has complex implications and introduces problems of personal responsibility. According to Fromm (1995, 102): “The danger of the past was that men became slaves. The danger of the future is that men may become robots.”

The military application of lethal autonomous weapons systems (LAWS) and Remotely Piloted Weapons Systems (RPWS) introduces profound ethical problems, including new possibilities of diminishing human casualties but also new opportunities for combatants to evade their responsibilities and to lower the threshold for the recourse to war. The United Nations Office for Disarmament Affairs (UNODA) opposes them. The International Committee for Robotic Arms Control (ICAC) favors international control. Numerous world governments have pursued the unrestricted development of LAWS.

Disagreements among the proponents of regulation have thwarted the development of international standards governing such weapons systems. In the absence of such constraints, militaries have therefore developed them at will.

Review of Research

LAWS/RPWS research has long been underway. The first discussions occurred in the early 2000s, as the United States (US) deployed drone strikes across the Middle East in its anti-terrorist efforts. These early technologies' target identification and execution tactics were immediately met with backlash and moral debate. Studies on civilian populations were especially prominent. Hudson (2011) found that drone warfare tended to galvanize civilian populations against their oppressors, the US in this case. This spurred the formation of insurgency groups

dubbed “accidental guerrillas” (p. 1). The militarization of civilian groups inevitably added to the bloodshed. Proponents of the technology, however, argued otherwise. Byman (2013) contended that targeted drone killings were much more effective in eliminating targets and reducing collateral, especially when compared to boots-on-the-ground tactics. There were also philosophical debates around this time. For example, Holmqvist (2011) asserts there was no line to draw between ‘virtual’ and ‘material’. Instead, these machines require us to restructure how we study war, notably in the corporeal and incorporeal sense.

More recent conversations focus on regulation. Meiers et al. (2016) argue that producing global regulations is a complex task that will take quite some time to complete and should be viewed as an evolving document. Meanwhile, Bieri et. al. (2014) fear that the rate of technological development is too rapid to wait. Rather, local treaties should be written now to curb further development. Specifically, the continued sophistication of Artificial Intelligence (AI) has been of central concern. Longpre et. al. (2022) explore the shortcomings of AI and contend that AI technologies are neither predictable nor reliable actors in war. They fear no real regulation will be made until a tragedy snaps global powers to urgency.

My paper considers the lack of regulations on LAWS/RPWS despite the incredible push to produce them. Why have policymakers and governments been ineffective in this task? Which points of conversation create these inefficiencies? How have pro-LAWS/PRWS social groups responded to calls to action? In doing so, I extend the discussion on regulatory practices surrounding LAWS and RPWS.

LAWS and RPWS provide necessary and valuable services to military *and* civilian populations.

Abstinence is the toughest stance on LAWS, and one Mr. Antonio Guterres, Secretary General of the United Nations (UN) and Vice President of the UN Security Council, endorses. Tasked with *maintaining international peace and security*, he believes "Machines with the power and discretion to take lives without human involvement (LAWS) are morally repugnant and politically unacceptable and should be prohibited by international law" (2023). This stance, however, had effectively narrowed the conversation to the point of unproductivity.

Resenting LAWS/RPWS is understandable. Weapons such as the Anti-Vehicle Mines (AVMs) deployed in Afghanistan and the Loitering Munitions deployed in Ukraine are known for their destructive impacts on civilian populations. AVMs, once deployed, autonomously detonate under sufficient weight. According to the Directorate of Mine Action Coordination (DMAC) for Afghanistan, there are over 350 million square meters of land contaminated by AVMs, which, since 1989, have claimed over 1,494 civilian lives. Due to their sweeping deployment, hidden nature, and immediate threat to civilian and refugee populations within the country, over 80,000 individuals have been internally displaced in 2018 alone. (Roberts, 2018, p. 6). Loitering munitions act as autonomous or remotely piloted hovering explosives that survey areas seeking target identification. Once identified, they fly their warheads into the target, detonating on impact. A report by the Office of the United Nations High Commissioner for Human Rights (OHCHR) on the current Russian-Ukrainian conflict detailed over 18 civilian casualties and 21 civilian injuries caused by these drones in November 2024 alone. The attacks targeted over 17 Ukranian energy infrastructure facilities, further crippling quality of life for civilians.

However, LAWS/RPWS have their merits. The IRON DOME is a fully autonomous defensive missile interceptor deployed solely in Israel. Its developers, Rafael Advanced Defense

Systems, report that its system has intercepted over 5000 rockets with a greater than 90% success rate over its 13 years of deployment. This technology has saved countless Israeli lives. Moshe Patel, the Director of the Israeli Ministry of Defense, stated in a 2025 LinkedIn post, “During the current war, the system was intensively deployed ... providing a critical layer of protection for civilian populations and strategic infrastructure.” Similarly, the United States and its allies utilize Phalanx Close-in Weapons Systems (CIWS). These fully autonomous sentry guns detect, track, and engage incoming naval threats. Its producer, Raytheon, claims it's the “Last line of defense”, keeping countless military personnel safe since its deployment in 1980 (Phalanx Weapon System, 2025). Even Kamikaze-Drones play a necessary role in military spaces. “[The] Switchblade 600 empowers the warfighter with … the capability to fly, track and engage non-line-of-sight targets and armored vehicles with precision lethal effects without the need for external ISR or fires assets” (AeroVironment, 2025). These technologies save money and keep soldiers out of harm's way. Telling any military that this same technology is morally repugnant does not open the door for discussion.

Multiple UN hearings have attempted to vote on an international treaty on LAWS. Countries leading in LAWS development, like the US, Russia, India, North Korea, and Belarus, have been historic dissenters. After over a decade, many have changed their tune to support. However, Russia has remained opposed due to the villainization of LAWS/RPWS. “We consistently oppose the language in the resolution that focuses primarily on ‘challenges’, ‘concerns’, and ‘negative consequences’ of LAWS on global international security. We are convinced that appropriate weapon systems can demonstrate much greater effectiveness than human operators in accomplishing their tasks and reduce the likelihood of errors and miscalculations.” (Nebenzya, 2024). Only recently has a resolution to begin work on a treaty

been passed, notably without unanimous agreement. More charitable approaches towards LAWS/RPWS could have helped pass this treaty sooner.

What these systems achieve, whether stopping thousands of missiles from striking a city (Patel, 2025) or identifying and intercepting a missile within milliseconds (Schuster, 2024), exceeds human capabilities. LAWS and RPWS fill critical, unoccupied warfare roles and protect lives. Knowing this, standing stalwart against LAWS/RPWS is simply disengenuous. They are not merely killers and should not be treated as such in conversation. Failure to recognize this obfuscates the discussion and has slowed progress towards regulation.

The development of LAWS and RPWS will neither halt nor slow while discussions surrounding regulation evolve.

Knowing LAWS/RPWS save lives just as they take them, numerous social groups have attempted to halt the progress of these technologies until laws regulate and distinguish between the ‘life-saving’ and ‘life-taking’ machines. The International Committee for Robotic Arms Control (ICRAC) in their 2010 Berlin Statement urged for the prohibition of “Further development, acquisition, deployment, and use of armed autonomous robot weapons” until there is global law. However, these calls to action have gone largely ignored by groups actively developing and utilizing LAWS/RPWS.

The Campaign to Stop Killer Robots, established in 2012, believes that to “avert a future of autonomous killing it will take all of us, pushing decision makers, together” (A Global Push, 2025). In the last 13 years, they’ve accrued over 250 organizations from more than 70 countries all working “to ensure meaningful human control over the use of force through the development of new international law” (Our Member Organizations, 2025). Notable proponents of their cause

include UN Secretary-General Antonio Guterres and the President of the International Committee of the Red Cross (ICRC), Mirjana Spoljaric. The general public further supports their message. A 2020 poll surveying 28 countries found that 60% of the sampled population opposed using LAWS (A Shared Movement, 2025). Their efforts finally came to a head in December of 2024, when the UN General Assembly finally adopted a resolution to produce a treaty on LAWS (Perrin, 2025). This, however, has only scratched the tip of the iceberg.

Remember, this adoption is only the first step in developing a treaty on LAWS. The work required to produce and enforce this treaty is muddy and laborious. The Chair of the Group of Governmental Experts (GGE), a subcommittee of the UN Office of Disarmament Affairs (UNODA), Robert in den Bosch, has been tasked with characterizing LAWS. In this fundamental task Bosch has identified 4 "issues" halting characterization. These include "the matter of at which point in the life-cycle of a weapon system autonomy appears; the distinction between military and dual-use systems; the footnote on 'lethality'; and the exclusion clause." (2024). These definitions must be generous enough for a voting body to agree and constrained enough to impede abuse. No doubt, there will be subsequent struggles in regulating and enforcing these definitions. Entrenched in such complexity and fragility, I would be surprised if the final treaty were produced by the end of 2026, as requested by Guterres and Spoljaric (Perrin, 2025).

In the time taken to adopt this UN resolution, both Israel and Russia have developed and deployed LAWS in their ongoing conflicts in Gaza and Ukraine, respectively. The Russian Defence Minister, Andrei Belusov, has mentioned at least two AI-powered drone detachments already deployed in eastern Ukraine, with plans to deploy five more in the region (2024). Likewise, a former legal advisor in the Israel Defense Force (IDF), Tal Mimran, spoke on integrated autonomous systems in Israel. "[between 2010 and 2015], you needed a team of

around 20 intelligence officers to work for around 250 days to gather something between 200 to 250 targets, … Today, the AI will do that in a week." (2024). Their continued usage of LAWS and RPWS is mostly unchecked by global forces and sets critical precedents in the development of the UN treaty. Even outside the context of war, countries like the United States (US) continue to develop LAWS/RPWS. The US Deputy Secretary of Defense, Kathleen Hicks has spoken extensively on pursuing the 'Replicator Initiative', which hopes "to leverage [drone] platforms that are small, smart, cheap, and many." (2023). This enthusiasm is spurred mostly by the US's pursuit of deterrence. "We must ensure the PRC [(People's Republic of China)] leadership wakes up every day, considers the risks of aggression, and concludes, 'today is not the day'" (Hicks, 2023). This fear-driven mindset causes countries to plow ahead in developing LAWS/RPWS. "To stay ahead, we're going to create a new state of the art — just as America has before — leveraging attritable, autonomous systems in all domains" (Hicks, 2023). This technology is not seen as unprecedented but rather as a new norm. In their minds, abstaining from development is not just stagnation, but regression. And regression is tantamount to death.

The rapid evolution of these weapons systems outpaces slow, bureaucratic policy-making. Countries and companies have no incentive or intention to stall development while waiting for global consensus. Thus, they won't. Until global consensus is reached, this technology will continue to evolve and further influence how conversations are had and laws are created, not the other way around.

The current conversations surrounding AI are quintessential to the conversation and add a great deal to the complexity of regulating LAWS/RPWS.

Using Artificial Intelligence (AI) to take lives has been a focal point of discussions regarding regulating LAWS/RPWS. The President of the Committee of the International Red Cross (ICRC), Mirjana Spoljaric, is against its application. She's held that "When it comes to the use of AI … human judgment must remain central, especially in decisions posing risks to people's lives and dignity." (2024). Similarly, many countries have adopted highly precautionary stances towards AI. China's Representative to the UN, Ambassador Fu Cong, has been on record stating "We [China] maintain that all countries, major powers in particular, should adopt a prudent and responsible attitude in the military development and use of AI technology ... so as to avoid misunderstanding and miscalculations and prevent arms races." (2024). Likewise, the US Department of Defense (DoD) in its 2025 resolution 3000.09 on LAWS stated, "The DoD will take deliberate steps to minimize unintended bias in AI capabilities... and the ability to disengage or deactivate deployed systems that demonstrate unintended behavior. " (2025). Despite these agreements, regulating LAWS/RPWS empowered by AI has not been simple. Nuances in regulating AI have added yet another wrinkle to the greater challenge of regulating LAWS/RPWS.

Yet again, UN Secretary-General Antonio Guterres has strong opinions on this topic. "I have long warned about unforeseen consequences of AI-enabled systems. Each advance creates new unimaginable vulnerabilities." (Guterres, 2024). Statements such as these instill a fear of AI. However, experts in the field disagree with Guterres. Yann Lecun, the Chief Scientist at Meta AI, at the 9821st UN Security Council Meeting, said, "Current AI technology is very focused on text and language, not on the real world." (2024). Palantir, another leader in the private AI sector, agrees with this perspective. Their Director of Privacy and Civil Liberties, Courtney Bowman, stated in a UK Parliament Hearing, "We're still in a place where these technologies operate

within boundaries." (2023). Both suggest current AI technologies do not pose a threat in the existential way that Guterres contests. Users of current AI-enabled war technology agree with Lecun and Bowman. Former Navy Pilot Missy Cummings notes, "The AI that we've got in the Department of Defense right now is heavily leveraged and augments people. ... There's no AI running around on its own. People are using it to try to understand the fog of war better." (2023). AI is not nearly as sentient or threatening as those who fear it may believe. Neither now, nor years from now. "At some point in the future, AI systems will match and surpass human intellectual capabilities. ... It will not happen tomorrow, probably over the next decade or two." (LeCun, 2024). Parallel to the general use of LAWS/RPWS, assigning an inherent morality to this technology and not its users has only narrowed the conversation to unproductivity.

Fears aside, AI is tricky to regulate because it exists and is developed in both private and public sectors. Algorithms built for civil purposes can be tweaked and applied for militaristic uses. This is known as a dual-use system. "Divergent views remain on the need to include or explicitly exclude dual-use systems from our working characterization" (in den Bosch, 2024). Private companies, specifically those interested in robotics development, have attempted to self-regulate dual-use applications. Six companies, including Boston Dynamics, Open Robotics, and Unitree, released a public letter against the weaponization of their products. "We pledge that we will not weaponize our advanced-mobility general-purpose robots or the software we develop that enables advanced robotics, and we will not support others to do so." (Boston Dynamics, 2023). However, in the same breath, Brendan Schulman, the Vice President of Policy and Government Relations at Boston Dynamics, raises contradictions. "To be clear, we are not taking issue with existing technologies that nations and their government agencies use ... makeshift efforts to weaponize general-purpose robots threaten public trust and acceptance of this emerging

technology.” (Schulman, 2023). Take note of the word makeshift. These companies do not mind weaponization if it is done ‘professionally’. They are interested in image, not safety. Thus, their efforts aid in dual-use regulation in only one direction: keeping weapons out of the public's hands.

Instead of differentiating, Bowman suggests leaning into AI as a military entity. “An operational, 'field-to-learn' approach to AI enables both technical innovation and ethical boundary setting” (Bowman, 2023). In not trying to separate AI between civil and military, regulation becomes less a question of technological capacity and instead a restriction on technological application. This frees up the technology to evolve in its natural capacity while expediting a framework for regulation. Instead, policymakers have attempted to corral a technology they simply can’t contain, further complicating the already complex problem of regulating LAWS.

Conclusion

Conversations around regulating LAWS and RPWS began as far back as 2014. Yet in the decade since, global regulation of these technologies does not exist. Social groups have failed to unite due to many strong, conflicting opinions brought on by fear and uncertainty. Those who fear its destructive abilities stand against it. Those who fear not owning that power themselves expedite its evolution. Today, LAWS/RPWS are here and in application. Like a good parent, humanity should foster a philosophy of acceptance. As it stands, there are no bad machines, only bad users. Taking LAWS/RPWS at face value and centering conversations around the use of these technologies, not the inherent good or evil within them, should go a long way. Working with the evolving situation instead of against it may make all the difference.

While no global regulations yet exist, there is still hope. These technologies will not necessarily leave a stain on history. Some are optimistic in the face of it. “It is often said that AI is enabling the next Industrial Revolution. I think the effect of AI on society may be more akin to the invention of the printing press and the wide dissemination of knowledge through printed material by amplifying human intelligence.” (LeCun, 2024). What policymakers must do now is learn from their misjudgments. There will, no doubt, be a future frontier requiring regulation; whether that be space as the next battlefront, genetically modified combatants, or fine-tuned biological warfare. Adapting today equates to more effective policy-making and global cohesion in the future.

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