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UN RESOLUTION ON LETHAL AUTONOMOUS WEAPON SYSTEMS

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Introduction

Given Ukraine's current state of affairs and the Red Sea crisis, stopping technological advancement in weaponry is impossible. The Gulf War of 1990-91 was a turning point for conventional weaponry, with the use of precise targeting ability leading to a reduction in civilian casualties. As a result, many systems are gradually adding more and more autonomous elements to weapon systems, either in response to what opponents are doing or as a natural progression of technology. Weapons will become more accurate and more likely to decide what they should hit and not hit as militaries incorporate more Artificial Intelligence (AI) into high-tech weapons in the future. Human operators find it extremely difficult to comprehend how sophisticated computer systems choose targets when more cognitive functions are being 'delegated' to machines. The software serves as the basis for targeting decisions. Human accountability is essential and challenging in a conflict zone and urban theatre. AI and the autonomy of Lethal Autonomous Weapon Systems (LAWS) allow for the development of completely new classes of robotic weaponry for use in the air, sea, and land.

The idea of meaningful human control is central to the international regulatory discourse around autonomous weapon systems, and maintaining proper human control over individual targeting decisions is crucial. After three years of informal expert meetings held under the auspices of the Convention on Certain Conventional Weapons (CCW), a 125-member inter-governmental forum that addresses emerging trends in armed conflict and munitions, the United Nations Group of Governmental Experts (UN

GGE) on Lethal Autonomous Weapon Systems (LAWS) was established in 2016. About 116 experts convened a meeting in 2017 and addressed a letter to the UN to alert it about the potential of AI and to caution against the implementation of LAWS, which will *"permit armed conflict to be fought at a scale greater than ever, and at timescales faster than humans can comprehend"*. According to a recent United Nations Security Council (UNSC) report, it is possible that LAWS first targeted humans for the first time in March 2020, during the Libyan war conflict. [1]In December 2021, the Sixth Review Conference of the UN (CCW)[2] was unable to advance talks on new legal frameworks to control the creation and application of LAWS. The five-day summit in Geneva was attended by nations that had already made significant investments in the development of LAWS[3]. Still, many participants prevented the summit from reaching a consensus on creating legally enforceable regulations on machine-operated weapons. Finally, the United Nations General Assembly adopted the "Lethal Weapons Systems" resolution on December 22, 2023.

The global governance of AI is becoming more complex even as countries try to implement ways to do so, ranging from Acts of law to executive orders. No convention has covered military applications of AI so far. Policymakers need to be aware of and consider the possible risks associated with increasingly lethal autonomous weapons, given the probable scenarios in which governments could use them in the future. The absence of human in these life-and-death decision-making situations raises a wide range of legal, ethical, and moral considerations, in addition to the likelihood of errors in judgment and unintentional conflict escalation.

Technological Advancements in Weapon Systems

The use of rockets and missiles has risen as a geopolitical tool of coercion for state and non-state actors. Militaries have used Air Defence (AD) systems for decades[4] to counter such threats. The study of AD systems shows the difficulties that automated and autonomous elements have already brought about regarding human-machine interaction. The nature of the interaction between humans and machines in air defence systems indicates that the quality of human oversight, particularly in targeting decisions, has gradually decreased over time. Weapon systems currently select and engage their targets without human intervention. The current Ukraine-Russia conflict has demonstrated the successful applications of cheap drones against legacy weapon systems. Suicide drones or loitering munitions using AI can autonomously approach their targets according to pre-programmed targeting parameters and attack when their sensors pick up an enemy's assets. They then attack the adversary using the capabilities of range, accuracy, mass, coordination, intelligence, and speed to shoot down assets faster than a human operator[5] could; also, they can remain in flight (or loitering) for far longer than human-operated munitions[6]. In addition, the nuclear overhang is being seen in the current Russia-Ukraine conflict on the threat of the use of tactical weapons by Russia[7], as in an incident in May 2024 where a Ukrainian drone [8] hit an early warning radar of the Russian missile forces and could have triggered a catastrophic real-world escalation.

Understanding LAWS

The distinction between autonomous and automated must be understood. 'Automated' is used when a "man-in-the-loop" operates the existing technologies. On the contrary, 'autonomous' is defined as an action that is "*undertaken or carried on without outside control".* LAWS are *"robot weapons that select and engage targets without human intervention*".[9] In other words, the ability to autonomously make decisions about the use of lethal force is a feature of LAWS. Autonomous weapons rely only on algorithms to strike, unlike unmanned military drones, where a human operator makes the decision remotely. Developing technologies like sensors, edge processing, etc, that support target identification and image processing with various offensive and defensive operational capabilities has made this possible. The potential risks of LAWS across the world have the following implications:

(a) **Weapons of Mass Destruction:** The existing autonomous weapons, like swarm drones, are scalable and can potentially become weapons of mass destruction.

(b) **Algorithmic Decision-Making:** The algorithm configured to match the 'target profile' is primarily responsible for the target's self-initiation trigger. It indicates the lack of an operator capable of anticipating and limiting the consequences of the actions taken during the operations, especially in urban areas.

(c) **Distinction**: According to the 1949 Geneva Convention, the use of force should be authorised by international treaties based on distinction, proportionality, and military necessity[10]. In the case of LAWS, it is challenging for the machine to distinguish and identify legitimate targets since it decides based on the information it gets and a set algorithm.

(d) **Proliferation:** The acquisition of these weapons by non-state actors and their impact can be considered violative of the element of proportionality.

Growth in AI Capabilities and Impact on the Battlefield.

The US Defence Advanced Research Projects Agency(DARPA) organised a series of competitions to stimulate the development of autonomous vehicle technology for military applications in 2004[11]. The RACER (Robotic Autonomy in Complex Environments with Resilience) programme's challenge involved teams from various backgrounds, including universities, corporations, and garage-based enthusiasts, competing to develop self-driving vehicles capable of navigating a desert course. The competition fostered cross-domain collaboration teams that brought together expertise from robotics, computer vision, advanced machine learning algorithms, simple sensor fusion methods, and artificial intelligence. The DARPA's Grand Challenge demonstrated the power of open innovation and crowdsourcing as teams leveraged diverse perspectives and approaches to tackle a complex problem. The challenge led to significant advancements in autonomous vehicle technology, laying the foundation for developing self-driving cars and military unmanned ground vehicles. The technological growth in missiles has led to the development of hypersonic boost-glide weapons, Fractional Orbital Bombardment Systems (FOBS), ballistic and cruise missiles supported by drone swarms, which have made high-value assets, including

radars, anti-satellite weapons, mobile missile launchers, and Command, Control, Communication, and Intelligence (C3I) systems vulnerable. On the side of defence, a host of new technologies are being developed to counter such threats using cyber defences like spoofing, manipulation, digital jamming, and electromagnetic pulses. These developments will force the attacker to use AI-augmented drones with sensors fused with machine learning that will search for the "target profile" using sensor data and then use AI-based decision-making tools to execute a range of core applications like air interdiction, long-range strike missions, amphibious ground assaults and maritime operations to neutralise the adversary.

Role of Artificial Intelligence

Though the human mind is blessed with infinite creative power and higher-order thinking Skills (HOTS), there have been remarkable advances in artificial intelligence. AI is data-driven, and algorithms can analyse complex data, identify patterns, support decision-making, and control complex physical systems[12] autonomously.

Some of the technologies which can even replace human judgement in military operations are as follows:-

(a) **Machine Learning and Autonomy:** Sophisticated machine learning algorithms can quickly analyse large datasets, model intricate phenomena, and generate predictions to guide decisions in real time without explicit human programming. This makes it possible for military systems such as unmanned aerial vehicles, missile defence networks, and drones to function at higher levels of autonomy by using dynamic contextual analysis.

(b) **Computer Vision**: Complex image and pattern recognition algorithms using drone and satellite imagery facilitate precision targeting. Visual data can also be used for object detection and to support autonomous navigation and swarm coordination among groups of drones or robots.

(c) **Natural Language Processing**: AI can automate the translation and analysis of audio using speech recognition algorithms which are relevant to military intelligence.

(d) **Reinforcement Learning and Simulations**: Self-learning algorithms can create optimal decisions for complex sequential decisions in dynamic combat conditions.

Artificial Generative AI (AGI) aims to emulate human cognitive abilities such that it allows it to do unfamiliar tasks, learn from new experiences, and apply its knowledge in new ways. AGI systems are capable of independent thought and objectives. AGI is not the same as artificial intelligence, which is designed to perform specific tasks such as image recognition and translation—at which it can outdo humans, but it remains limited to its set parameters. It might pass the Turing test[13] , which assesses a machine's ability to demonstrate intelligent behaviour identical to humans. Still, it is not self-aware, incapable of independent decision-making and fails to capture human emotions. Since the technology is still in the early stages of its development, it is difficult to predict what shape an AI-based weapon targeting system may take in the

future. Two major issues which impact the functioning of Air Defence (AD)systems are:-

(a) Though the decision-making cycle's software aids the operators, who must be confident in the automation process, they can be prone to automation bias and excessive trust. Generative AI, trained on the massive flow of human language and culture, has already absorbed our biases[14].

(b) A common cause of failure is the complexity of human-machine interaction. Therefore, the programme must be thoroughly examined since poor decisions can result from over-delegating situational knowledge, particularly in high-stress circumstances.

Legal Initiatives to Rein in LAWS

The United Nations Group of Governmental Experts (UN GGE) on LAWS was established in 2016 after three years of informal expert meetings under the auspices of the Convention on Certain Conventional Weapons (CCW)[15]. In August 2018, the GGE released the policy guidelines, focussing on the human element in the development and deployment of LAWS[16]. The GGE's Report outlines the following three basic policy guidelines:

1. *Human accountability cannot be transferred to machines.* Legal precedents prohibit treating humans and machines equally. Humans are accountable for all stages of the creation, implementation, and utilisation of LAWS.
2. States are responsible for providing both non-physical and physical safeguards for LAWS. States need to secure their weapons system against cyber-attacks, theft, and damage by other state and non-state actors.
3. *International Humanitarian Law (IHL) applies* to developing, deploying, and using emerging weapon systems.

The European Parliament, in 2020, urged the European Union (EU) to establish a "global framework" on the military use of AI and pushed for banning LAWS internationally. On May 17, 2024, the Council of Europe took a big step by adopting the Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law, also known as the AI Convention. It announced the creation of an AI Office to regulate artificial intelligence. A "Framework Convention" is a legally binding treaty that specifies the broader commitments and objectives under the convention and sets mechanisms to achieve them. However, the AI convention has not created any new and substantive human rights specific to AI. Instead, it asserts that the existing human and fundamental rights protected by international and national laws will also need to stay protected during the application of AI systems.[17] The resolution on 'Lethal Weapon Systems' adopted by the United Nations General Assembly on December 22, 2023, is as follows:

(a) **International Humanitarian Law (IHL) Compliance**: Lethal Autonomous Weapon Systems (LAWS) present significant challenges to IHL compliance, particularly concerning the principles of distinction, proportionality and accountability. Addressing these challenges requires comprehensive legal and ethical frameworks to guide the responsible development and use of LAWS in armed conflict, minimising civilian risks and ensuring adherence to humanitarian principles[18].

(b) **Risk of Unintended Consequences**: The introduction of LAWS poses significant risks of unintended harm to civilians and civilian infrastructure due to autonomous decision-making and its inherent limitations and complexities in dynamic conflict environments. Addressing these risks requires comprehensive ethical, legal and technical frameworks to guide the responsible development of LAWSs and deployment while upholding humanitarian principles and minimising civilian casualties.

(c) **Lack of Human Oversight**: It is seen that during military operations the absence of human supervision could pose serious threats involving civilian safety, legal compliance to accountability. The repercussions could be serious considering the malfunctioning in these LAWS. In addition, no human could be held accountable for any kind of life-threatening decisions raises ethical and legal concerns. Thus, it is the need of the hour that LAWS adheres to the international humanitarian laws and upholds ethical the safety of civilians.

(d) **Ethical Considerations:** The ethical ramifications of using LAWS in armed conflict extend far beyond mere legal compliance. The use of autonomous systems raises questions about human control over the use of force and the inherent value of human decision-making in situations involving life and death. Ethical frameworks must guide the development and deployment of LAWS to ensure alignment with humanitarian principles and respect for human dignity.

Conclusion

Lethal autonomous weapons using AI enable entirely new categories of robotic weapons that can be deployed across land, sea, and air. The absence of solid international governance frameworks directly risks an uncontrolled AI arms race. The Indian Armed Forces have initiated steps to incorporate AI in various roles[19]. While the development of new systems is planned, academia, industry, and Services need to collaborate from the inception of the development of autonomous weapons. A trained cadre must test the systems for critical failures or when the system operates under external attack before the systems are inducted. In order to assist organisations and individuals in determining whether a certain AI technology will be valid, dependable, safe, secure, private, and fair once deployed, the nation should have organisations that are capable of assessing the risks and impacts of AI.

From a legal perspective, thorough training and dissemination of knowledge in IHL and proper Rules of Engagement (ROEs) for using such weapons is considered one way of addressing the issue. The effects on the battlefield also bring up serious, still-unresolved ethical questions about human vs machine control. Who is accountable for mistakes, biases, or unlawful attacks when AI algorithms operate weapons intended to kill humans? As AI gets quicker and more powerful, can weapon autonomy and human oversight coexist safely? Revised legal doctrines that anticipate these issues may be necessary. Advanced AI poses previously unheard-of risks as wars in the modern era play out in both the physical and digital domains, but it may also pave the way for more destructive warfare. As militaries delegate more decision-making to intelligent algorithms, holding human operators, commanders, and leaders accountable for civilian casualties is a key safeguard to ensure that accountability issues are not overlooked while operating an autonomous system.

Disclaimer: Views expressed are of the author and do not necessarily reflect the views of CENJOWS.

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