





EMPLOYMENT OF LETHAL AUTONOMOUS WEAPONS SYSTEMS UNDER INTERNATIONAL LAW AND ETHICS: IS THE STATUS QUO ENOUGH?

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INTRODUCTION

In 2015 a group of global leaders in the field of robotics and artificial intelligence (AI) released an open letter speaking out against the use of AI in the creation of autonomous weapons and requesting a ban on the development of autonomous weapons that could use lethal actions outside of the span of human control.¹ In this letter they stated that "Artificial intelligence technology has reached a point where the deployment of such systems is — practically if not legally — feasible within years, not decades…"² and identified a requirement for prompt action in banning autonomous weapons in order to quell the foreseeable arms race. Their letter also raised the fear that due to the relatively low cost of autonomous weapons and the ready commercial availability of the materials required to make them their development could be achievable by all significant military powers.³ This raised the concern of autonomous weapons finding their way onto the black market to be used to perpetrate violent acts by non-state actors.⁴

In August 2017, many of these same individuals penned a second open letter which reiterated their concerns and commended the United Nations (UN) on establishing the Group of Governmental Experts on Lethal Autonomous Weapons Systems.⁵ They called upon this group

¹ Berkley Engineering, "Open Letter," last modified 1 November 2015,

https://engineering.berkeley.edu/news/2015/11/open-letter-on-ai/.

² Ibid.

³ Ibid

⁴ Ibid.

⁵ Future of Life Institute, "An Open Letter to the United Nations Convention on Certain Conventional Weapons," accessed on 18 April 2021, https://futureoflife.org/autonomous-weapons-open-letter-2017/.

to find a "means to prevent an arms race in these weapons, to protect civilians from their misuse and to avoid the destabilizing effects of these technologies."⁶

While many in the defence community will outline the many benefits of lethal autonomous weapons systems this paper will demonstrate that despite these benefits there are still legal and ethical issues surrounding the employment of such systems in combat. These issues must be addressed by the international community and a consensus reached on the limitations of the use of LAWS prior to their mass availability. This paper will explore the current international laws that govern the use of lethal autonomous weapons systems, the ethical situations surrounding their use and discuss some of the solutions currently being proposed by various nations in the international community.

There are variations in the definition of what a lethal autonomous weapons system is and the international community has yet to come to an agreed definition. Caitlin Mitchell suggests that the lack of a global definition is due to the fact that a fully functioning LAWS has yet to be created, therefore the complete technology required to operate them and their final capabilities are still theoretical in nature.⁷ As a result, current working definitions are based on theory and therefore can vary between stakeholders involved in the development and regulation of LAWS.

One of the most widely cited definitions of a lethal autonomous weapon system is the one drafted by the International Committee of the Red Cross, which defines it as: "Any weapon system with autonomy in its critical functions. This is a weapon system that can select and

⁶ Ibid.

⁷ Caitlin Mitchell, "When Laws Govern LAWS: A Review of the 2018 Discussions of the Group of Governmental Experts on the Implementation and Regulation of Lethal Autonomous Weapons Systems," *Santa Clara Computer and High-Technology Law Journal 36*, no. 4, (May 2020): 410.

attack targets without human intervention".⁸ In this definition the word "attack" denotes an engagement of a target using kinetic means with an intent to cause physical damage to or the destruction of the intended target.⁹ While there is much discussion over the exact meaning of some of the words in this definition such as the word "target," it will be the definition used for the purpose of this paper.

BENEFITS OF LAWS

While many leaders in the fields of robotics and artificial intelligence denounce the use of lethal autonomous weapons systems in combat there are many potential benefits of employing them onto future battlefields.

A common benefit across all unmanned systems, whether they are remotely operated or autonomous, is the fact that they can conduct dull, dirty and dangerous tasks that would otherwise pose a risk to a human operator.¹⁰ While the advantages of conducting dirty and dangerous tasks remain relatively equal between remotely operated and autonomous systems, the major difference is in the ability to conduct dull tasks. When it comes to dull work LAWS could conduct long range patrol or sentry duty that may be mentally and physically fatiguing for a human to conduct. This can also hold true for the operators of remotely operated systems. While many of the adverse environmental factors such as weather and temperature can be mitigated by remote operators, they can still become fatigued as a result of constantly monitoring the displays

⁸ International Committee of the Red Cross, *Autonomous Weapon Systems: Implications of Increasing Autonomy in the Critical Functions of Weapons* (Versoix: ICRC, 2016), 8.

⁹ Ibid.

¹⁰ Shawn McKay et al, *Automating Convoys: Technical and Tactical Risks and Opportunities* (Santa Monica: RAND Corporation, 2020), 7.

of their remote systems. As a result of this fatigue, there is a greater chance of a human operator error causing unintended harm to friendly forces or civilians. The fact that LAWS do not fatigue would mitigate this risk.¹¹

The other benefit that autonomous systems have over remotely operated ones is the fact that once they are programmed they would not require a constant communication link to a human operator to complete the mission. In an environment where the enemy has the ability to deny all or portions of the electromagnetic (EM) spectrum, they would be able to disrupt the communication link between a remotely operated system and its operator, thus rendering it inoperable or at least ineffective.¹² Without the requirement of a constant communications link autonomous systems could freely operate in a denied environment, thus reducing the risk of an adversary EM attack on operations.

It can also be argued that lethal autonomous weapons systems may be more ethical in their decision to engage a target due to their lack of human emotional response.¹³ West Point philosophy professor, Lieutenant-Colonel Chris Mayer, believes that a number of war crimes occur as a result of a military member seeking revenge for the death of a comrade or when they are acting out of fear for their own lives.¹⁴ These war crimes, which occur as an emotional reaction to a situation, could easily be avoided with the employment of LAWS on the battlefield as their response to an adversary action would not be emotionally based.

¹¹ Chris Mayer, "Developing Autonomous Systems in an Ethical Manner," in Autonomous Systems: Issues for Defence Policy Makers (The Hague: NATO Communications and Information Agency, n.d.), 67.
¹² Ibid.

¹³ Kjølv Egeland, "Lethal Autonomous Weapons Systems under International Humanitarian Law," *Nordic Journal of International Law 85, no.* 2 (2016): 101.

¹⁴ Mayer, "Developing Autonomous Systems in an Ethical Manner", 70.

LAWS IN INTERNATIONAL HUMANITARIAN LAW

The main area of international humanitarian law that pertains to the employment of lethal autonomous weapons systems in combat is the law of armed conflicts which in principle governs the conduct of both international and non-international conflicts.¹⁵ Specifically, the rules pertaining to the conduct of warfare are captured within the Additional Protocol 1 of the Geneva Convention.¹⁶ While Additional Protocol 1 has not been ratified by all members of the United Nations it has been deemed to be customary international law by the International Court of Justice and therefore applies universally to all nations.¹⁷

Within Additional Protocol 1 there are four articles which could apply to the employment of lethal autonomous weapons systems.

Part IV of Additional Protocol 1 concerns the protection of civilians in combat. The first article in Part IV, Article 48, provides the basic rule for conducting military operations in the presence of civilians. It states, "the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objects and accordingly shall direct their operations only against military objects."¹⁸ This principle of distinction is becoming more difficult to achieve in modern combat. Unlike in past conflicts when opposing forces were easily identifiable by their uniforms, equipment or insignia, modern

¹⁵ Egeland, "Lethal Autonomous Weapons Systems...", 91.

¹⁶ *Ibid*.

¹⁷ Ibid, 92.

¹⁸ International Committee of the Red Cross, "Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977" accessed 14 April 2021, https://ihl-

databases.icrc.org/applic/ihl/ihl.nsf/xsp/.ibmmodres/domino/OpenAttachment/applic/ihl/ihl.nsf/D9E6B6264D7723C 3C12563CD002D6CE4/FULLTEXT/AP-I-EN.pdf.

conflict often involves non-state actors who's tactics rely on them blending in with the civilian population in the area of operations.¹⁹ As such it is difficult enough for humans to differentiate between combatants and civilians on the battlefield, let alone for them be able to program lethal autonomous weapons to make the distinction.

Article 51 of Additional Protocol 1 deals with the protection of the civilian population during military operations and prohibits indiscriminate acts due to the fact that there is an increased chance that such an act could harm both military objectives and civilians without distinction. The definition of an indiscriminate attack include attacks "not directed at a specific military objective"²⁰ and "those which employ a method or means of combat the effects of which cannot be limited as required by this protocol."²¹

In addition to prohibiting indiscriminate acts, Article 51, along with Article 57, requires proportionality when collateral damage is expected to occur during the engagement of a legitimate military target. Article 57 states that parties to a conflict shall ensure that if there is an expectation of civilian injury or death or damage to civilian property then this must be proportionate to the military advantage gained by attacking the target.²² Article 51 also states that any attack which does not meet this proportionality clause is considered to be indiscriminate and is therefore prohibited.²³ As Oxford University's Kjølv Egeland points out, determining proportionality is not an exact science and as such it would be difficult to program a lethal

¹⁹ Rebecca Crootof, "The Varied Law of Autonomous Weapons Systems," in *Autonomous Systems: Issues for Defence Policy Makers* (The Hague: NATO Communications and Information Agency, n.d.), 105.

²⁰ International Committee of the Red Cross, "Protocol Additional to the Geneva Conventions..."

²¹ *Ibid*.

²² Ibid.

 $^{^{23}}$ Ibid.

autonomous weapons system to be able to determine if an attack is proportional.²⁴ Dr. Chris Madsen goes further in his discussions of proportionality when he states that "proportionality balances the military demands and conscience."²⁵ This calls into question the ability of a lethal autonomous weapons system to be able to determine if an attack which it is about to undertake is proportional. Being a machine it obviously does not have a conscience as required by Madsen and programming proportionality parameters into it, to allow it to truly be autonomous, is not likely achievable in the near future. This means that LAWS are unable to determine proportionality and as such their use in war would not be legal under Additional Protocol 1 of the Geneva Convention.

Article 35 describes the basic rules on the methods and means of warfare and ties together the requirements of the three articles discussed above. Under this article "it is prohibited to employ weapons, projectiles, and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering."²⁶ If LAWS were unable to distinguish between combatants and non-combatants or determine proportionality of an attack then their use would also be prohibited under this article as it would constitute a weapon or method of warfare that causes unnecessary suffering.

Considering the current level of sophistication of artificial intelligence, lethal autonomous weapons systems would not be able to meet the principles of discrimination and proportionality as required under Additional Protocol 1 of the Geneva Convention. Therefore

²⁴ Egeland, "Lethal Autonomous Weapons Systems...,"104.

²⁵ Chris Madsen, "Use of Force," in Military Law and Operations (Aurora: Canada Law Book, 2008), 7-4.

²⁶ International Committee of the Red Cross, "Protocol Additional to the Geneva Conventions..."

any attack carried out by LAWS would likely be considered indiscriminate and consequently illegal under international humanitarian laws. That being said it is difficult to determine if artificial intelligence will be developed to a point where LAWS will be able to discriminate between civilians and combatants and determine the proportionality and military necessity of an attack. Based on a legal basis alone it is impossible to determine if the current legal framework is robust enough to determine the legality of the employment of lethal autonomous weapons systems onto a battlefield. We must therefore look at some of the ethical considerations surrounding the use of LAWS in combat.

ETHICAL CONSIDERATIONS

When it comes to the ethical considerations surrounding the employment of lethal autonomous weapons systems there are two main areas to consider: human dignity, including the right to life, and a lower threshold for war.

Human dignity, including a right to life, forms the basis of all international humanitarian law and international human rights law.²⁷ Its importance in international law is underscored by that fact that it is mentioned in the opening passages of both the Charter of the United Nations²⁸ and the Universal Declaration of Human Rights.²⁹ Unlike the legal considerations under international humanitarian laws, when considering human dignity and the ethical use of lethal autonomous weapons systems we need to consider the means by which the decision to attack an

²⁷ Christof Heyns, "Human Rights and the use of Autonomous Weapons Systems During Domestic Law Enforcement," *Human Rights Quarterly* 38 (2016): 367.

²⁸ United Nations, "United Nations Charter: Preamble," accessed 30 April 2021, https://www.un.org/en/about-us/un-charter/preamble.

²⁹ United Nations, "Universal Delcaration of Human Rights," accessed 30 April 2021, https://www.un.org/en/about-us/universal-declaration-of-human-rights.

individual is made, more so than the why.³⁰ The concern is that by allowing an autonomous systems to determine if a person should or should not be attacked we are in effect ignoring their human dignity and treating them as objects³¹. Human Rights Law Professor Christof Heyns describes this indignant act: "a machine, bloodless and without morality or mortality, cannot fathom the significance of using force against a human being, and cannot do justice to the gravity of the decision."³² Based on this quote, Heyns argues that only a human should be able to decide whether another human lives or dies.³³

The introduction of lethal autonomous weapons systems to the battlefield have a high likelihood of lowering the threshold for war, or at least the threshold for aggression. Physicist and peace researcher Jürgen Altman and international security researcher Dr. Frank Sauer suggest that LAWS will lower the threshold for war due to the fact that their use will reduce the number of casualties resulting from a conflict.³⁴

In his 2013 report as the UN Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, stated that most people have a strong desire to preserve both our own lives and that of those close to us. He acknowledged the fact that most people do not want to kill another human. As a result humans have a natural resistance to going to war. In turn this makes governments reluctant to enter into conflict as it is not the wish of the voters.³⁵ If a nation

³⁰ International Committee of the Red Cross, *Ethics and autonomous weapons systems: An ethical basis for human control?*, (Geneva: ICRC, 2018), 10.

³¹ *Ibid*.

³² Heyns, "Human Rights and the use of Autonomous Weapons...", 370.

³³ Ibid.

³⁴ Jürgen Altman and Frank Sauer, "Autonomous Weapons Systems and Strategic Stability", *Survival* 59, no 5. (2017): 130.

³⁵ Christof Heyns, *Report of the Special Rapporteur of extrajudicial, summary or arbitrary executions*, (n.p.: United Nations General Assembly, 2013), 11.

were to employ LAWS in battle it could result in fewer soldiers being engaged in combat and subsequently fewer casualties. This decreased risk to a nation's sons and daughters would result in a decrease in the level of political pressure a government faces to not enter a war thus making aggressive action a more palatable option for decision makers.

Human dignity and a lowered threshold of war are just two of the main ethical issues which are taken into consideration when studying the use of lethal autonomous weapons systems in conflict. These two issues make it evident that there are ethical concerns with the employment of LAWs that need to be taken into consideration during their development in order to ensure that they do not impinge upon human rights or lower the threshold for war to a point where conflict is the easy solution to solve international differences.

SUGGESTED WAYS FORWARD

Given the legal and ethical concerns surrounding the employment of lethal autonomous weapons systems in combat, the international community has made a variety of proposals on the way forward for developing and employing LAWS. These range from NGOs calling for a complete ban on truly autonomous systems, to nations or groups of nations suggesting that development should continue so we know exactly what LAWS will be capable of. This section will outline some of these recommendations.

The Campaign to Stop Killer Robots is a coalition of over 180 international, regional and national NGOs, coordinated by Human Rights Watch,³⁶ whose goal is to bring about a complete

³⁶ Campaign to Stop Killer Robots, "Members," accessed 30 April 2021, https://www.stopkillerrobots.org/members/.

ban on fully autonomous weapons and maintain human control of the use of force.³⁷ In 2019 they proposed elements which should be included in a "Treaty on Fully Autonomous Weapons."³⁸ They believe that any treaty regulating the use of lethal autonomous weapons systems must include three elements at a minimum. First, is "a general obligation to maintain meaningful human control over the use of force."³⁹ Second, is a "prohibition on specific weapons systems that select and engage targets and by their nature pose fundamental moral or legal problems."⁴⁰ Third, is a "specific positive obligation to ensure that meaningful human control is maintained in the use of all other systems that select and engage targets."⁴¹

As discussed above, many of the legal and ethical concerns surrounding the use of LAWS in conflict center on the idea that an autonomous system may not have the same ability to make decisions on distinction, proportionality and dignity as a human being. By including these three elements in a treaty on autonomous weapons, the decision to use force would be left to a human operator in-the-loop in the decision making cycle. A human operator could make determinations on the legal and ethical issues previously mentioned.⁴² Such a treaty would also make it illegal to use lethal autonomous weapons systems without a human operator to make a decision to use lethal force.

³⁷ Campaign to Stop Killer Robots, "About Us," accessed 30 April 2021, https://www.stopkillerrobots.org/about/.

³⁸ Bonnie Docherty, *Key Elements of a Treaty on Fully Autonomous Weapons*, (n.p.: Campaign to Stop Killer Robots, 2019), 1.

³⁹ *Ibid*, 5.

⁴⁰ *Ibid*, 6.

⁴¹ *Ibid*, 7.

⁴² *Ibid*, 3.

The other proposals on the use of LAWS come from nations or groups of nations involved in the United Nations Convention of Certain Conventional Weapons (CCW) Group of Governmental Experts (GGE) on Lethal and Autonomous Weapons Systems. The GGE consists of delegations from nearly 100 countries and 26 international organizations and NGOs.⁴³ At the conclusion of the last full meeting of the GGE in 2019, participants agreed on 11 guiding principles which will facilitate further discussion once they are able to reconvene following the Covid-19 pandemic. These principles confirm that international humanitarian law applies to all lethal autonomous weapons systems and that consideration must be given to ensure that employment of future autonomous technologies continues to comply with these laws. ⁴⁴ As well as compliance with IHL, the principles direct that humans remain responsible for the actions of LAWS and that only humans can be held accountable for the actions of an autonomous system.⁴⁵ While this principle does not specifically state humans must make the final determination on if a LAWS can use force, it does leave the door open for this restriction to be implemented in international agreements.

There is also a principle dealing with the security of lethal autonomous technology. It is written to ensure that it cannot be attained by non-state actors or become susceptible to a cyber-attack resulting in control of a system being lost by the rightful owner.⁴⁶ If such security was not

⁴³ Meeting of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, CCW/MSP/2019/9, (Geneva: December 2019), 2.

⁴⁴ Ibid, 10.

⁴⁵ Ibid.

⁴⁶ *Ibid*.

required it could become difficult to attribute responsibility for the actions of an autonomous system to a particular human, thus contravening the previously mentioned principles.

The remaining principles provide guidance on the drafting of future international policy on the use of LAWS, including an affirmation that the CCW is the appropriate venue to create such a policy and a recognition that such a policy needed to balance "military necessity and humanitarian considerations."⁴⁷

Overall, these 11 principles create an initial framework for a future international agreement on the development and employment of lethal autonomous weapons systems. While this shows some progress, nations including the United States, China and Russia still have widely divergent positions on the issue.⁴⁸ As a result, the likelihood of a widely accepted international treaty in the near future is low, further driving a potential arms race among the technological advanced nations to develop LAWS before their development is regulated.

CONCLUSION

While there are military benefits to employing lethal autonomous weapons systems in conflict, these are outweighed by the legal and ethical risks that their employment may bring. Given that such technology is still in development and therefore its true capabilities are still speculation it is difficult to determine what such systems will and will not be capable of. Will a LAWS be able to distinguish between a combatant and non-combatant as reliably as a human soldier? Will experts in artificial intelligence develop an algorithm which will allow an

⁴⁷ *Ibid*.

⁴⁸ Mitchell, "When Laws Govern LAWS...," 422.

autonomous system to infallibly determine proportionality? The answers to these questions are unknown. Until such a time as we are able to answer them, the international community must continue to pursue international regulations on the employment of LAWS. With the current level of technology the use of lethal autonomous weapons systems would likely constitute a breach of international humanitarian law and would therefore be unethical.

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