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Lethal Autonomous Weapons and Modern Warfare: A Study of Ethical and Legal implications

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ABSTRACT

Emergence of new technologies has revolutionized the methods of warfare and the way battles are fought. Development and deployment of lethal autonomous weapon systems (LAWs) is an emerging trend in the modern warfare. LAWs use AI algorithms and advance sensors technology to detect, engage and attack the targets without intervention of humans. The delegation of power to use force and kill or destroy something in the hands of robots is in violation of human dignity. The use of lethal autonomous weapon systems poses real legal, ethical and security challenges. This study uses doctrinal methodology to provide an analysis of legal and ethical issues surrounding the use of autonomous weapons. The study analyses the ethical concern of assigning accountability and applicability of current legal regime and existing IHL principles on autonomous weapon system. This paper concludes that artificial intelligence has not yet reached the threshold that allows reliable deployment of LAWs without proper regulations and legal standards.

Introduction

Technology has impacted all spheres of life including health, education, judiciary and communication. Warfare is not an exception to it as the emerging technologies have impacted and revolutionized the means and methods of warfare. In this era of artificial intelligence and machine learning computers has replaced the humans in many areas. Cyber, electronic warfare and autonomous weapons have replaced the conventional methods of warfare. Autonomous weapons also known as lethal autonomous robots or killing robots are weapons that can select and engage targets without human intervention. They use advanced technologies including Artificial Intelligence, machine learning, sensor and different software systems to identify and attack their targets.

The use of autonomous weapons in warfare has changed the conventional methods to fight a war. It is challenging the application of current legal regime and principles of International Humanitarian Law. Humanitarian law provides different principles to regulate the conduct of hostilities. These principles include distinction between civilians and combatants, principle of proportionality and military necessity. The current legal regime requires a controlled conduct of hostilities where commander is responsible for all the violations and war crimes. The use of lethal autonomous weapons system (LAWS) will exclude the human intervention and decision making to use the force. A human can intelligently make a decision on proportionality and necessity of use of force. To delegate this function and power to the robots and machines will produce lethal consequences for humanity. Autonomous weapons are incapable of complying with the exiting legal framework and principles of military conduct.

Where technology has a positive impact offering advantages in speed, precision and situational awareness at the same time it has raised many challenges. This study analyses potential ethical and legal challenges posed by the use of autonomous weapons. These challenges include ethical and legal concerns. The ethical concerns regarding the use of LAWS based on the debate that machines lack the deliberation and creative thinking of humans. It is unethical and violate the human dignity to delegate the power to kill humans to a machine.

The existing laws and principles of that regulate conduct of hostilities and military operations cannot be applied to autonomous weapons. There is a need for a comprehensive legal framework to regulate the use of force by robots and the mechanism to fix liability for violations of laws.

Literature Review

Lethal autonomous weapons systems have spurred extensive debate regarding their legality and ethical concerns under International law. This literature review examines key perspectives and arguments within scholarly and policy oriented texts on this area.

Compliance of International Humanitarian Law

One of the most significant concerns on legality of LAWs is that whether these weapon systems comply or respect the IHL principles including principle of distinction, proportionality and military necessity. Scholars argues that IHL does not allow the use of weapons that is not able to distinguish between combatants and civilians or assess the proportionality in real time.

Bothe (2015) examines the challenges LAWs pose in complying with the principles of IHL and relevant legal framework. Autonomous weapons rely on sensors and algorithm decision making which might not match human judgment in complex combat scenarios.

Meizer (2016) argues that ensuring compliance with IHL requires robust programming and control mechanism but even with advance technology uncertainty and unpredictability in warfare poses significant risks.

Accountability and Responsibility

As the fully autonomous weapons operate without intervention and control of nay human so it raises questions about accountability for any possible violation of laws.

Asaro (2012) examines the accountability gap noting that traditional legal framework struggles to fix liability when autonomous systems are involved. If LAWS misidentify or malfunction and commits a war crime it is unclear that who will be responsible for that unlawful action. It is a

significant question that whether the manufacturer, operator or military commander will be accountable for the action.

Crootof (2015) discussed the need of new and comprehensive legal framework and legal standards to address the accountability gap. He suggests the inclusion of rigorous testing and certification processes for LAWS before deployment of these weapons.

Ethical concerns

Beyond legal issues, LAWS also raise many ethical concerns.

Heyns (2013) discusses the potential for LAWS to violate human dignity by leaving life and death decisions of human to a robot. It violates right to life under International Law if they are used without proper control and safeguards. He emphasizes the importance of maintaining meaningful human control over autonomous systems to ensure ethical decision making.

Lethal Autonomous Weapons System (LAWs)

A lethal autonomous weapons system is a type of weapon also known as killer robots. The weapon system is designed to select and attack targets without human intervention and operates independently. This system uses artificial intelligence, machine learning algorithms and sensors to make decision to kill or destroy anything. It includes drones, robots or another type of weapons that operate independently e.g. the South Korean SGR-1 sentry gun can automatically detect and fire the targets.

The United Nations Office for Disarmament Affairs (2021) has provided some characteristics and functions of lethal autonomous weapons system. These include autonomous capabilities to detect and select targets, use of AI algorithms and ability to operate independently.

How LAWs Operate

This part discusses that what are different types of the autonomous weapon system and how they operate.

Use of Artificial Intelligence (AI) and Machine learning

This system uses AI algorithms to process and analyzes the data to identify the potential targets and attack the targets based on predetermined criteria for example the size, shape and movement patterns. Some specific AI algorithms used in autonomous weapons systems include deepstack (used for autonomous drone navigation), Alphago (used for strategic decision making) and Libratus (for autonomous negotiations)

Example of this type of weapon is the US Navy's SM-6 missile that uses AI to identify and track the target including enemy ships and missiles.

Use of sensors

This system of weapons uses different types of sensors for data collection such as cameras and radars. These sensors collect the data from surrounding environment to identify and track the target. The Israeli Harop loitering munition uses camera and radar to detect and attack the potential targets.

Classification on the basis of autonomy

Once a target is selected then the autonomous weapon detect, track and attack it without any human intervention. These weapons have different levels of autonomy that includes

Human in the loop

In this type a human is in control of the operations. This weapon is safe to use for targeting objects. A human operator reviews and approves targets before engagement and attacking the target. Here it is easy to control the operation of weapon and to fix liability in case of any violation.

Human on the loop (HOTL)

This refers to a design approach that incorporates human oversight and control over the decision making process of autonomous weapon. In this design the weapon is able to identify, detect and engage the target but a human operator can intervene and override the decision of machine. This system operates in between the full autonomy approach and human in the loop design which raise ethical concerns. It raises concerns regarding effectiveness and feasibility of human oversight in high speed and complex situations.

Full autonomy

This design refers to the weapons that operates independently without any intervention, control or oversight of a human being. These weapons use advanced algorithms, sensors and artificial intelligence to detect, engage and attack the target without human intervention. These are the lethal weapons and can kill or destroy any identified target without any moral and legal liability. The use of this weapon is argued to be arbitrary and unethical on basis of unaccountability. This has raised debates over ethical and legal concerns. Many human rights organizations have called for ban on the use of these weapons. Examples of fully autonomous weapons include autonomous sentry guns, robotic soldiers and ground vehicles, autonomous underwater vehicles, China's sharp claw drone and Russia's Uran -9 robot tank.

Mobility and Deployment

LAWS can be deployed on various platforms including aerial drones, ground vehicles, naval vessels and even stationary systems. Depending on the platform these systems can have high mobility with some drones capable of high speed maneuvers and ground vehicles designed for rough terrains. Advanced communication systems enable Laws to operate in a networked environment, sharing data with other units and receiving commands from remote operators or command centers. They also include measures against electronic jamming and cyber-attacks.

Current legal framework to regulate warfare

The current legal framework to regulate warfare and hostilities includes customary and treaty based IHL. These existing IHL principles are applicable on autonomous weapons system as well (ICJ advisory opinion 1996). Here is an overview of the relevant legal instruments and efforts.

International Humanitarian Law (IHL)

Geneva Conventions 1949

There are four Geneva conventions that form the core of IHL, setting rules for the conduct of armed conflict. These conventions provide protections for combatants and civilians. There are protections for those not participating in hostilities and prisoner of wars. There is a category of protected objects as well e.g. protection of national heritage property.

Additional Protocols to Geneva Conventions 1977

These provide further guidance on the application of IHL and supplements Geneva Conventions. These provides protections in International and Non International armed Conflicts.

Convention on Certain Conventional weapons 1983

This convention seeks to prohibit or restrict the use of specific types of conventional weapons considered excessively injurious or having indiscriminate effects. The CCW framework includes protocols on non- detectable fragments, mines, bobby traps, incendiary weapons and blinding laser weapons. Since 2018 the Secretary General holds the position that lethal autonomous weapons are politically unacceptable and morally repugnant.

UN Secretary General's Disarmament agenda (2018)

In 2018 Un Secretary General called for a ban on machines that have the power and discretion to take human lives without human intervention, stressing the member States to drfat legal standards on the development and deployment of Laws. UN office of disarmament also holds same agenda and supports member States to negotiate regulations on emerging autonomous weapons.

National regulations and Policies

United States

The department of Defense Directives 3000.09, issued guidelines in 2012 for the development and deployment of autonomous and semi- autonomous weapons. The guidelines emphasizing the importance of human judgement in the use of lethal force.

European Union

The EU parliament has called for a ban on the development and use of fully autonomous weapons emphasizing the control an oversight of humans on use of force against humans and objects.

The existing legal framework seems to be not very effective against LAWs and indicates a need for a more effective and comprehensive legal standard to address the ethical and legal challenges raised by autonomous legal systems.

Ethical Concerns in use of Lethal Autonomous Weapons

The development and deployment of lethal autonomous weapons system are highly controversial. It has raised significant ethical concerns on use of these weapons. Although many of these systems are not fully autonomous and some systems still operated and controlled by humans. They require approval before engaging and attacking a target but the effectiveness of this control and oversight is questionable. This part discusses some of the ethical concerns and challenges regarding use of autonomous weapons system.

Violation of human dignity

It is important that what means and methods are being employed to attack the enemies during warfare. The laws of hostilities regulate that what methods and weapons can be used during military operations. The weapons that can cause unnecessary suffering are not allowed to use e.g. dum dum bullets or biological weapons. The existing legal framework protects the human dignity even during war. It is against the dignity of humans that their life is in the hand of a mere algorithm decision (ICRC, 2018). Allowing machines to decide on life and deaths of humans raises many significant ethical concerns about the value of human life.

Unaccountability

One of the major concern regarding the use of force by autonomous weapons is the fixation of liability (IEE Global Initiative 2019). Algorithms used in the autonomous weapons may malfunction due to some error. This can result into misidentification of target leading to civilian killings and unintended harm. In case of any misidentification of malfunctioning of machine there can be massive damage to civilian objectives. In this situation the question of accountability and liability remained unaddressed. As most of the autonomous weapons operate without any human oversight or intervention so it lacks the accountability.

Autonomous decision making

Although computers can be more precise in calculations and faster in decision making but they lack human power of deliberation and creative thinking. The use of autonomous weapons lacks the ability to judge the situation and to use force according to military necessity and principle of proportionality. These are core principles to regulate the conduct of hostilities. These weapons system operates on basis of predetermined criteria and detect the target by processing the data feed to them. A little technical error can result in massive damage (Anderson and Waxman 2013). Robots cannot think and judge the situation like humans. It poses serious challenge to vest them with the power of killing and destroying as a risk of unintended damage is there.

Use of force without human intervention

Another significant concern with the use of LAWs is that they operate independently without intervention of any human. There must be effective human control over autonomous system to address the ethical concerns (Sharkey, 2010). Human Rights Watch 2020 advocates for a preemptive ban on fully autonomous weapons.

Uncontrolled proliferation of weapons

There is risk of illegal and uncontrolled proliferation of these weapons leading to uncontrolled spread and use by the non- state actors and terrorist groups. It can raise security concerns globally. Allowing the use of autonomous weapons can lead to an arms race potentially destabilizing the world.

Legal challenges on use of lethal autonomous weapons

The development and use of autonomous weapons raise major legal challenges. The deployment of these weapons have changed the dynamics of warfare so the existing legal frame work cannot regulate them. This part discusses some of the legal challenges posed by emergence of lethal autonomous weapons.

Violation of principles of International Humanitarian Law

First and most significant legal challenge regarding the use of LAWS is the potential violation of principles of IHL. Some of the important principles of IHL are distinction, proportionality, military necessity and unnecessary sufferings. All these principles are at risk of violation as the autonomous weapons are not designed to respect them. The robots cannot distinguish between combatants, civilians and lawful targets. There is a certain criteria given by law to provide combatant status but it varies sometimes. A human can distinguish the lawful and unlawful military targets while a robot cannot. A human can judge the hors de combat (an injured combatant) who is protected under law but a robot lacks this ability. Similarly, an autonomous

weapon may not be able to assess the proportionality and military necessity in heat of battle. Hence there is a higher risk of war crimes and violation of laws by the machines.

Lack of regulations and legal framework

In its advisory opinion on the 'legality of use of nuclear weapons' the ICJ states that although there is no legal framework or treaty existed to regulate the use of nuclear weapons but by applying martin clause the already existing principles of IHL are applicable to these weapons (ICJ, 1996).

By the virtue of Marten clause, the existing legal framework e.g. Geneva Conventions, additional Protocols and customary IHL is applicable to the LAWS. But the nature of these weapons require a different and comprehensive new legal framework that can effectively regulate the use of autonomous weapons. A new legal framework is required addressing the matters of accountability and liability for violations of laws resulting by use of autonomous weapons.

Humanitarian Concerns and Human Rights Violations

Deployment of fully and lethal autonomous weapons can potentially violate human rights e.g. violation of human dignity and right to life (Docherty 2015). Many humanitarian organizations (Human Rights Watch 2021), UN office of disarmament advocate for strict regulations or an outright ban on use of LAWs to ensure the integrity of human life.

Conclusion

The development and deployment of lethal autonomous weapons has sparked considerable debate regarding the legality of these weapons. Though these weapons offer certain advantages during warfare including precision, speed, reduced risk and harm to the soldiers but also pose serious ethical, legal and security challenges. The challenges posed by these weapon systems outweigh their positive aspects. These weapons have not been used against humans yet but there are examples of their use against military objects. There is a serious threat and psychological impact raised by development of these weapon systems. Use of technology is important but balancing the negative and positive aspects is critical in this regard. The existing legal framework provides foundational principles to regulate use of weapons during warfare including principle of distinction, proportionality and command responsibility but these principles are not applicable on LAWs because of the different nature of these weapons. There are different levels of autonomy on which these weapon systems operate. The design with humans in loop is safe to use but the fully autonomous weapons pose serious legal and security threats. The legal and ethical challenges surrounding the use of fully autonomous lethal autonomous weapon systems are profound and multifaceted. This study discussed few of these challenges including assigning accountability, compliance with International law and International Humanitarian law. There is a risk of violation of core principles of IHL. It is responsibility of all states to develop legal standards and regulations to address these concerns as it is crucial for global security. It is imperative to negotiate new treaties and bring amendments in existing legal framework to get the modern weapons system aligned with fundamental humanitarian principle and to address the issue of attribution and permissible level of autonomy.

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