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AI and Warfare

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Introduction

The 4th Industrial Revolution that will be powered by artificial intelligence (“AI”) has the potential to impact all areas ranging from public policy, governance, security, foreign policy, technological development to even minute everyday activities like locating the closest gas stations. AI is not fiction anymore and is the real game changer in the 4th industrial revolution. AI has both positive and negative applications wherein it can create massive creative and destructive disruptions that will resonate for years to come. Used as a force for good, AI can improve the quality of education, health, and lifestyle or prevent climate change. However, there is a huge potential for misuse of such a powerful and unknown technology without any regulation and international consensus on national security, foreign policy, etc. Further, inaccurate or non-specific definitions of terms regarding emerging technologies such as AI lead to a lack of understanding of the technologies’ issues, dangers, and applications. Thus, collaboration between hard science and social sciences is the need of the hour to tackle legal, ethical, moral challenges that AI brings forth.¹ The AI revolution has even brought weaponry systems under its stride, where AI-driven autonomy is the new realm of warfare.

Human civilization has witnessed wars for centuries. With the evolution of civilizations, wars have simultaneously undergone evolution to a point where the means of warfare are heavily planked upon the evolution of technology. With the development of Autonomous Weapons Systems (“AWS”) or Lethal Autonomous Weapons (“LAWS”) also called revolutionary “fire-and-forget” weapons driven by AI in their core functions, the impact of AI in battlefield is tremendous. These weapons process data from algorithms and on-board sensors to identify, monitor, and attack targets without human intervention. AWS is categorized as lethal (and hence become LAWS) when the targets include human beings.²

However, while these autonomous weapons bear tremendous potential, the outcry over AWS and LAWS has reached new heights. The Secretary-General of the United Nations recently urged for an international ban on killer robots, calling their usage ‘morally reprehensible’.³ The definition of ‘autonomy’ and the blurring of boundaries between legitimate use and abuse stand in the way of a global consensus on the future of lethal or killer robots.

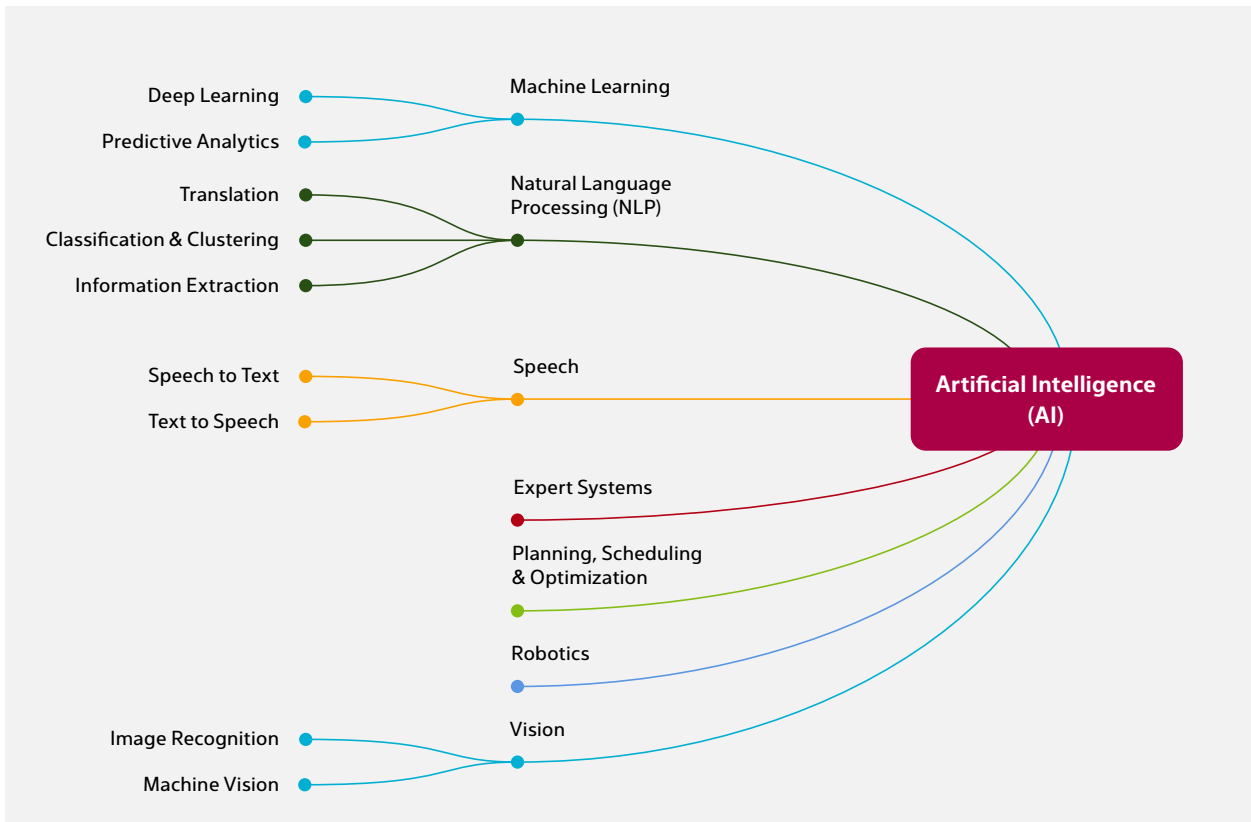
1 TTCSP, University of Pennsylvania, ‘2019, Artificial Intelligence and Think Tanks Report (TTCSP,2019) ch 1 available at: <https://static1.squarespace.com/static/593e8c54e3df286fa006bd85/t/605660e17e7c406eebe88aa2/1616273633571/Copy+of+Palo+Alto+AI+Forum+Report.pdf>, accessed 23 August 2021.

2 Stuart Russel, ‘Take a stand on AI weapons’ (Nature, May 28, 2015), <https://doi.org/10.1038/521415a>, accessed 23 August 2021.

3 ‘Killer Robots: Urgent need to Fast-Track Talks’(HRP Blog, 2 August 2021), <https://clinics.law.harvard.edu/blog/2021/08/killer-robots-urgent-need-to-fast-track-talks/>, accessed 24 August 2021.

Understanding AI

AI is a field of computer science geared towards replicating components of human intelligence through computer programming. Simply put, AI is the capability of a machine to imitate intelligent human behavior.¹ It is an umbrella term that encompasses multiple technologies including machine learning, neural computing, deep learning, computer vision, natural language processing (“NLP”), machine reasoning, and strong AI.²



Source: Atlam, Hany & Walters, Robert & Wills, Gary. (2018). *Intelligence of Things: Opportunities & Challenges*. 10.1109/CIOT.2018.8627114.

From health care to self-driving cars to all kinds of things, the permeation of AI in our day-to-day lives has become more pronounced. This emerging ubiquity of AI in the civilian as well military realm reflects that it cannot be contained. In the next section, application of AI in the warzone is discussed via focusing on the underlying technology and various legal, ethical and moral challenges.

1 N.P. Padhy, *Artificial Intelligence And Intelligent Systems* (1st edn, OUP 2005)3.

2 PR Newswire, 'Artificial Intelligence Market Forecasts' (PR Newswire, 2021) available at: <http://www.prnewswire.com/news-releases/artificial-intelligence-market-forecasts-300359550.html>.

AI in the Warzone

AWS and LAWS have been introduced in the combat strategy of many nations. The global expenditure on AWS is predicted to amount to \$16 billion by 2025.³ The United States alone is projected to spend about \$17.5 billion on Unmanned Aerial Vehicles (“UAV”) and other drone-based LAWS between 2017 and 2021.⁴ Many countries such as Israel, China, Iran, Russia, the United States, Germany, India, South Korea and Azerbaijan use loitering munitions such as Switchblade and Harop, which enable unmanned aircrafts to engage missiles to undertake a search and destroy action.⁵

While, the terms AWS and LAWS have been used interchangeably by some authors, LAWS are in fact a subset of AWS. Unfortunately, there is no globally agreed definition of either of these terms. In this paper we take LAWS to refer to those AWS that are used to target human subjects, as opposed to those AWS intended to target non-human subjects. If the distinction isn't clear yet, consider Israel's Iron Dome defence system, designed to intercept enemy rockets.⁶ This system is a good example of an AWS that is not a LAWS.

Since LAWS is a special case of AWS, much of the underlying technology remains the same across both the weapon systems. There are however, some advanced algorithms specific to LAWS (such as those used to identify targets) which are not present in all AWS. In the next section, we will dive deeper into the technology employed by LAWS.

Underlying Technology

LAWS constitute the amalgamation of powerful computing and weaponry. LAWS primarily use two main technologies namely AI and Computer Vision (“CV”). CV is an AI technique which is used to extract information from visual data. Facial recognition algorithms are one of the most widely used CV techniques. Under the hood, LAWS are capable of running computationally intensive AI-algorithms. This is what distinguishes them from conventional weapon systems. In addition, LAWS rely on many different sensors to provide the necessary data for processing. These sensors may be distributed across a network of LAWS to optimize space and efficacy. Once the data has been processed, LAWS use a gun or some other form of ammunition to act on this data. For example, aerial-based LAWS may be fitted with explosives that can be dropped from above, underwater LAWS may have torpedoes, and ground-based LAWS may use machine guns or rockets.

LAWS also have the ability to work together with other weapon systems, sharing information to more efficiently perform a task. In fact, this collaborative ability of LAWS was exploited in 2020, when Turkish forces used swarms of autonomous drones to target and kill Libyan National Army Forces (“LNAF”).⁷ These drones used CV algorithms to detect members of the LNAF, perhaps identifying them based on their uniform. Once identified, the drones used onboard weapons to target and kill members of the LNAF.

3 Bryan McMahon, 'The Rise of Killer Robots and the Race to Restrain Them' (Skynet Today, 7 September, 2020), <https://www.skynettoday.com/overviews/killer-robots>, accessed 23 August 2021.

4 Ibid.

5 Kelsey, 'Atherton, Loitering Munitions Preview the Autonomous Future of Warfare' (Brookings, 4 August, 2021), <https://www.brookings.edu/techstream/loitering-munitions-preview-the-autonomous-future-of-warfare/>, accessed 25 September 2021.

6 How Israel's Iron Dome Missile Shield Works' (BBC, 17 May 2020), <https://www.bbc.com/news/world-middle-east-20385306>, accessed 25 September 2021.

7 Stuart Russel, 'Anthony Aguire & ors, Lethal Autonomous Weapons Exist: They Must be Banned' (Spectrum, 16 June 2021), <https://spectrum.ieee.org/lethal-autonomous-weapons-exist-they-must-be-banned>, accessed 20 August 2021.

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If one drone was able to locate a region with a high-density of LNAF members, it could possibly send a message to the other drones, with its GPS coordinates, so that they could join forces and take down the LNAF members more quickly.

In the above use of autonomous drones by Turkish forces, the level of autonomy with such drones is not known. It is also not known if the killings were being authorized by some remote operator. Typically, when people talk about the dangers of LAWS, they are referring to the dangers of letting an algorithm or a machine decide who to kill, and to go ahead with the killing without any approval from a human operator. However, it is pertinent to note that not all LAWS are afforded the same level of autonomy: the degree of human involvement varies along the spectrum.

Broadly, there are three classes of LAWS, based on their degree of autonomy:

- i. **Remotely operated weapons:** (These weapons can be attached on all kinds of military vehicles, which may be manned or unmanned in nature. Although remotely operated, these weapons contain some automated features to optimize their precision in challenging environments.⁸ For instance, Kongsberg has developed a suite of weapons ranging from one size of a hand gun, to a full-sized military tank gun.);⁹
- ii. **Semi-autonomous weapons:** (This system is often referred to as “human in the loop.” This weapon system may assist with, or be in charge of, target detection and identification. However, a human must provide authorization before any action — the weapon cannot pull the trigger on its own, without human approval. The Taranis unmanned aircraft, developed by BAE Systems, is one of the most sophisticated semi-autonomous weapons in the world.¹⁰ It can perform surveillance over large areas, identify targets, and gather intelligence about hostile territories. Yet, a human operator monitors all the activity and is eventually the one dictating the course of action) and;
- iii. **Fully-autonomous weapons:** (Are autonomous in every way. Much of the developments in this space are confidential, and highly contested for ethical and legal reasons. If in fact the Turkish drones discussed above are operated without any human in the loop, then they would constitute one of the first instances where fully-autonomous LAWS have been employed. Another example, although primarily a defensive weapon, is South Korea’s SGR-I, with the ability to detect, target and shoot trespassers from over two miles away).¹¹

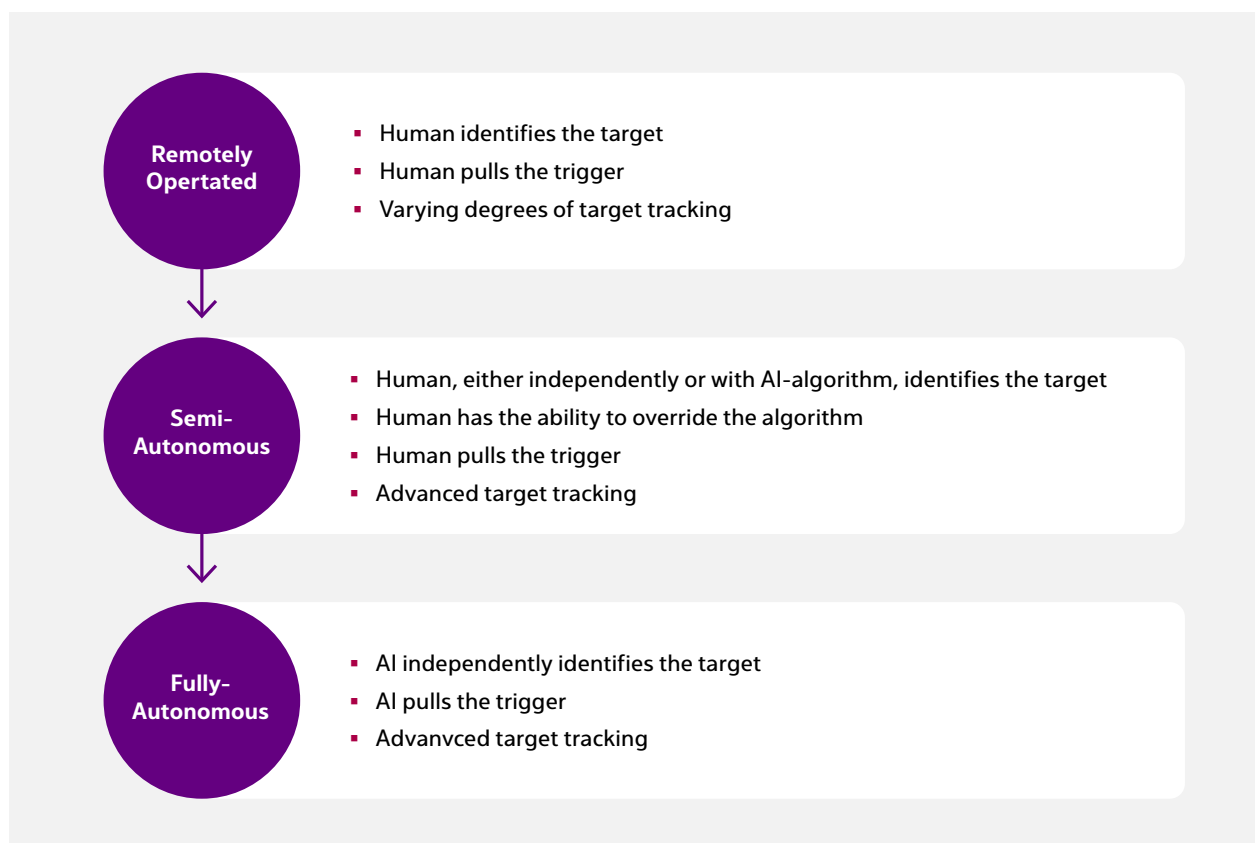
8 ‘Protector RT60’ (Kongsberg), <https://www.kongsberg.com/kda/products/defence-and-security/remote-weapon-systems/protector-mct/>, accessed 16 August 2021.

9 ‘Remote Weapon System’ (Kongsberg) <https://www.kongsberg.com/kda/products/defence-and-security/remote-weapon-systems/>, accessed 16 August 2021.

10 ‘Taranis’ (Baesystems), <https://www.baesystems.com/en/product/taranis>, accessed 16 August 2021.

11 Guia Marie Del Prado, ‘These Weapons Can Find a Target all by Themselves- and Researchers are Terrified’ (Business Insider, 31 July 2015), <https://www.businessinsider.com/which-artificially-intelligent-semi-autonomous-weapons-exist-2015-7?IR=T>, accessed 20 August 2021.

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Challenges Faced by the Underlying Technology

Spectrum of Autonomy

Semi-autonomous and fully-autonomous weapons are controversial in large part because of the lack of human-driven decision making. Humans have the ability to explain to a person, on what grounds they selected a particular person to target. If the target was in fact correctly selected, the explanation is of little significance. However, if the wrong person is targeted, the human who selected the target will usually be thoroughly questioned and made to explain the reason for selecting the given target. In contrast, LAWS use AI-algorithms that perform a series of complex mathematical optimizations to select the target. Designing these algorithms in a way in which their output is explainable, especially in target selection is very crucial.

While LAWS may be state of the art weapons, they cannot evade some fundamental limitations of their underlying technology. No AI-algorithm can ever be 100% accurate all the time. Since LAWS are driven by imperfect algorithms, there is always a margin for error. This makes it imperative for any algorithm-based target identification system to be “explainable.” What this means is that the algorithm must provide insights on the rationale behind the target selection. The insights might take the form of performance metrics like “95% match of facial features”, “gun identified in hand”, “target location matches previously suspected location” and so on. The Defense Advanced Research Projects Agency has identified the need to explain AI-driven decision making as one of the most important steps towards the future of combat.¹²

¹² Dr. Matt Turek, ‘Explainable Artificial Intelligence (XAI)’ (DARPA, 2016), <https://www.darpa.mil/program/explainable-artificial-intelligence>, accessed 16 August 2021.

Explainability

Explainability is very important because of an inherent bias present in every AI-algorithm. When biased algorithms make decisions for LAWS, there could be dire consequences. Algorithmic bias is the result of training and feeding an AI algorithm with biased data. The challenge is that most real-world data is biased. A popular and illustrative example of algorithmic bias was explained by researchers from Harvard University, who found that since society has historically been racist, AI-algorithms trained using historical data tended to be racist as well.¹³ In the context of warfare, such bias could result in the killing of innocent people who were misidentified as the target.

Threat of Hacking

In addition to the safety issues related to AI-algorithms discussed above, there is also the threat of these weapons getting hacked by an enemy. With any advanced technology, LAWS working collaboratively require a means to communicate with one another. If the communication signals were somehow intercepted, this would give away their location. Worse, the signals could be manipulated to disorient the LAWS and cause them to misfire or attack the wrong target. If an enemy captures LAWS, they might also be able to break into its hard-drive and access highly confidential information that could lead to grave national security concerns.

Legal and Ethical Challenges

While nations are investing heavily in AWS and LAWS, increasing levels of automation have led to an outcry over legal and ethical implications. This is especially pertinent considering that no consensual definition or regulatory framework exists for LAWS till date. One possible reason for this is that these technologies keep evolving and the standard for intelligence is set higher and higher. Various campaigns advocating for regulation of LAWS or complete ban is at the forefront of a global debate. They claim that the regulation and ban on killer robots is paramount in establishing a principle-based restriction on “killing-yielding automation” as well as in ensuring regulation of emerging technology that has the ability to jeopardize world peace and security.¹⁴ Common concerns in relation to LAWS include erratic communication between algorithms, algorithmic bias and dissimilar computer programs, which may result in loss of life instead of securing it. When put in the wrong hands, LAWS can also be used to undertake ethnic cleansing or genocide.¹⁵

In the future, we may find that AI-based robots for warfare are more reliable and accurate than their human counterparts. After all, humans are also far from perfect when it comes to target identification and execution. Yet the ethical question persists: should algorithms have the authority to determine who to kill and execute the killing? Regardless of the answer, LAWS remain vulnerable to other issues like signal jamming, hacking, and malware intrusions in cases of remote controlled weapon systems. Absence of human intervention could also prevent the ability of the programmers to abort or overhaul a particular mission in case of an emergency, could severely reduce human oversight of combat operations resulting in possible violations of laws of war and could even jeopardize efforts to reduce escalation of the war.

13 Alex Najibi, 'Racial Discrimination in Face Recognition Technology' (SITN Boston, 24 October 2020), <https://sitn.hms.harvard.edu/flash/2020/racial-discrimination-in-face-recognition-technology/>, accessed 16 August 2021.

14 Denise Garcia, 'Killer Robots: Why the US Should Lead the Ban' (2015) 1(6) Glob.Policy, <https://onlinelibrary.wiley.com/doi/abs/10.1111/1758-5899.12186>, accessed 23 August 2021.

15 Kelsey Piper, 'Death of Algorithms: the age of killer robots is closer than you think' (Vox, 21 June 2019), <https://www.vox.com/2019/6/21/18691459/killer-robots-lethal-autonomous-weapons-ai-war>, accessed 23 August 2021.

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It is very likely that in the next 20 years to come, we will have swarms of unmanned systems, airborne, ground, surface, different units operating together. This debate is about rights as well as about the process of use of such technology and in the next section, international legal regulatory frameworks are discussed, with an aim to highlight the possible regulations and human rights that are ought to be protected.

International Humanitarian Law and AWS

There has been much debate around the use of AWS in warfare in international academic circles. Arguments for and against the development and use of AWS in warfare have been explored from the perspective of International Humanitarian Law (IHL). The normative framework of International Humanitarian Law (*jus in bello*) is based upon some basic principles, which are the very foundation of its credibility and capacity to influence the practice of states. These principles could be summarized as follows:

Basic Principles of IHL

- **Humanity:** respect for human dignity in its entirety and protection against acts of violence or intimidation.
- **Distinction:** it is necessary to distinguish clearly and objectively the combatants from civilians.
- **Proportionality:** force must be proportional to the military objective in view, so as to minimize the chances of collateral damage.
- **Necessity:** military action should not cause unnecessary harm or suffering, especially to the civilian population not directly involved in the conflict.
- **Precaution:** Before any attack, the parties to the conflict must verify and ensure that the target is neither a civilian, nor subject to special protection.

There is an urgent need to find appropriate ways to merge military necessity and humanitarian considerations in line with IHL. Interestingly, IHL was made to regulate warfare and the conduct of states during war, not prohibit it unlike the International Human Rights Law (IHRL), which is discussed in the next section.

The obligation to respect and ensure respect for international humanitarian law in all circumstances is primarily derived from Common Article 1 of the 1949 Geneva Conventions and Additional Protocol I,¹ as well as is reflective of customary international law derived from ‘the general principles of humanitarian law to which the Conventions merely give specific expression’.² This obligation encompasses both a negative duty of States to refrain from violating international humanitarian law, including the obligation not to encourage, aid or assist the commission of violation,³ and a positive duty to undertake all measures necessary to comply with their obligations under applicable rules of international humanitarian law in peacetime or in situations of armed conflict.⁴

1 Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field of 12 August 1949, 75 UNTS 31 (entered into force 21 October 1950); Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea of August 12 August 1949, 75 UNTS 85 (entered into force 21 October 1950); Geneva Convention Relative to the Treatment of Prisoners of War of 12 August 1949, 75 UNTS 135 (entered into force 21 October 1950); Geneva Convention Relative to the Protection of Civilian Persons in Time of War of 12 August 1949, 75 UNTS 287 (entered into force 21 October 1950); Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), adopted 8 June 1977, 1125 UNTS 3 (entered into force 7 December 1978) [hereinafter Additional Protocol I]; Jean-Marie Henckaerts and Louise Doswald-Beck, Customary International Humanitarian Law (CUP, 2005) Rule 139, as updated by the International Committee of the Red Cross (ICRC) at: <https://ihl-databases.icrc.org/customary-ihl/eng/docs/home>, accessed 21 September 2021.

2 Nicaragua v. USA (Merits) [1986] ICJ Rep 14, 114 para. 220.

3 Ibid.

4 Hitoshi Nasu, ‘Artificial Intelligence and the Obligation to Respect and to Ensure Respect for International Humanitarian Law’ (2019) Exeter Centre for Internal Law Working Paper Series 3/2019, 8: https://socialsciences.exeter.ac.uk/media/universityofexeter/collegeofsocialsciencesandinternationalstudies/lawimages/research/Nasu_-_AI_and_IHL_-_ECIL_WP_2019-3.pdf, accessed 18 September 2021.

IHL focuses on ‘people’ being the focal point of the application of its principals and if the protection of people is the main object then the responsibility of states conforming to the IHL, for protection of ‘people’ can-not be entirely placed on the robots or AWS because of multiple reasons. The basic adherence of the IHL principals would require some level of involvement of humans in contemporary battlefields.

Regarding the general State-responsibility concept of breach, an employment of AI-related technologies in armed conflict may implicate hundreds of primary obligations originating in IHL and other fields of law applicable in respect of armed conflict. For example, first, under Article 48⁵ of Additional Protocol I of 1977 and its customary-law counterpart, the parties shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives.

Therefore, there is an obligation to ensure w.r.t. use of AWS technologies in warfare — the specific attributes of: (i) discernibility of the civilian population; (ii) discernibility of combatants; (iii) discernibility of civilian objects; (iv) discernibility of military objectives. Any employment of AWS in a military operation which lacks one (or more) of those specific attributes may arguably be impermissible on that ground.⁶ This is so because, it is unclear whether the AWS would have the intelligence to distinguish between lawful and unlawful targets. These weapons lack the human qualities that can help them in making such determinations, specially in battlefields where the employed personnel often seek to conceal their identities. This is a part of the principle of ‘distinction’ and ‘precautions’ of the IHL.

Article 57, paragraph 2, sub-clause (b) of Additional Protocol I of 1977 states that “*an attack shall be cancelled or suspended if it becomes apparent that the objective is not a military one or is subject to special protection or that the attack may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.*”⁷ In this relation, the general State responsibility can entail an obligation for the state party engaging with the AWS in its warfare to ensure —: (i) cancellability; (ii) suspensibility; (iii) discernibility of (non-)military-objective status; (iv) discernibility of (non-)special-protection status; (v) discernibility of incidental loss of civilian life that may be caused; (vi) discernibility of injury to civilians that may be caused; (vii) discernibility of damage to civilian objects that may be caused; (viii) discernibility of a combination of incidental loss of civilian life, injury to civilians, and damage to civilian objects; (ix) discernibility of the concrete and direct military advantage anticipated;⁸ and to assess whether the damage caused is more than directly anticipated military advantage. The last assessment is the part of the principle of ‘Proportionality’ of IHL.

There are specific measures that States can employ to implement their obligation to respect and ensure respect for IHL. These specific duties are instrumental to the implementation of various rules of IHL in good faith — such as giving orders and instructions to ensure observance of the Geneva Conventions, ensuring that legal advisers are available to military commanders, and disseminating the texts of the Conventions.⁹

5 Additional Protocol I of 1977, art. 48.

6 Dustin Lewis, ‘International Legal Regulation of the Employment of Artificial-Intelligence-Related Technologies in Armed Conflict’, (2020) *Moscow J. Int’ L.* 53.

7 Additional Protocol I, art. 57.

8 *Ibid.*

9 Additional Protocol I, arts. 80(2), 82 and 83.

Article 36 of Additional Protocol I to the Geneva Conventions specifically provides that: “*In the study, development, acquisition or adoption of a new weapons, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party.*” The states by virtue of this, are under an obligation to ensure that the deployment of AWS in international warfare are not used to cause superfluous injury or unnecessary suffering or of an indiscriminate nature. Thus, any incorporation or integration of AI into the existing weapons system or weapons development programmes to build new capabilities will be subject to the obligation to conduct weapons’ review. However, this is subject to its own limitations such as — only a handful of States are known to have systematic approaches to the legal review of new weapons.¹⁰

Since many nations which are traditionally not known for weapon development have started dabbling into the development of AI for warfare, these nations thus might not have sophisticated systems in place for weapon review. Moreover, many applications of AI may not qualify as ‘weapons’ or ‘means of warfare’ because of this legal review obligation. These terms are not defined in Article 36 of Additional Protocol I.¹¹

Control of Export

The State parties are not obligated to regulate export of arms under customary international law or under the Geneva Conventions or the Protocols thereto. However the use of Arms Trade Treaty can ensure the implementation of the obligations under the IHL.

There is a prohibition under the Arms Trade Treaty upon transfer of conventional arms if it is known that those arms would be used in, “*the commission of genocide, crimes against humanity, grave breaches of the 1949 Geneva Conventions, attacks directed against civilian objects or civilians protected as such, or other war crimes as defined by international agreements to which it is a Party.*”¹² States Parties are required to assess the potential that the arms or items could be used to commit or facilitate a serious violation of international humanitarian law.¹³ Common Article 1 of Geneva Conventions requires High Contracting Parties to refrain from transferring weapons if there is an expectation, based on facts or knowledge of past patterns, that such weapons would be used to violate the Conventions. This regulation comes with its own challenges, mostly because it’s limited to certain categories of conventional arms only, secondly because the end use of such weapons cannot be monitored, specially in case of AWS. There was a challenge regarding the legality of the arms export by the United Kingdom (UK) to Saudi Arabia due to allegations of grave breaches of IHL in *R (Campaign Against Arms Trade) v. Secretary of State for International Trade*¹⁴ — where the UK High Court dismissed the challenge. The Court of Appeal subsequently deviated from the High Court and observed that the precondition for making a rational decision was missing due to the absence of definitive legal assessment of Saudi Arabia’s past conduct during armed conflict.¹⁵

10 ICRC, ‘A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1977’ (2006) Int. Rev. Red Cross 931, 934 fn 8; James D Fry, ‘Contextualized Legal Reviews for the Methods and Means of Warfare: Cave Combat and International Humanitarian Law’ (2006) 44 Columbia J. Transnatl. Law 453, 473-479.

11 Supra at 23.

12 Arms Trade Treaty, adopted 2 April 2013, 3012 UNTS (entered into force 24 December 2014), art. 6.

13 Arms Trade Treaty, adopted 2 April 2013, 3012 UNTS (entered into force 24 December 2014), art. 7.

14 *R (Campaign Against Arms Trade) v. Secretary of State for International Trade* (2017) EWHC 1762.

15 (2019) ECWA Civ 1020.

Other than the above, the International Law Commission gives two legal consequences of an internationally wrongful act which can be a part of a State's responsibility — Cessation and Reparation. This general State responsibility concept of cessation entails that a State responsible for an internationally wrongful act is under an obligation to cease that act if it is continuing, and, if circumstances so require, to offer appropriate assurances and guarantees of non-repetition.¹⁶

Individual Responsibility under International Criminal Law

The need for personal accountability is derived from the goals of criminal law and the specific duties that international humanitarian and human rights law impose.

There are certain general individual responsibility concepts such as mens rea or mental element,¹⁷ attribution, prohibited conduct etc. With respect to attribution the, International Criminal Court statute (ICC), under Article 25(I) says that the ICC has jurisdiction over natural persons. ICC statute lays down a list of 'prohibited conduct' (act or omission) that can tantamount to war crimes.¹⁸ Use of AI laced AWS can be covered under 'prohibited conduct' to regulate individual actions in war crimes. The ICC statute makes a person criminally responsible and liable for the punishment only if the mens rea or the mental elements are proved.¹⁹ This means that one can only be held guilty if the intention to and the knowledge of the war crime is proved. This places a responsibility on the individual to be mindful of the actions and the consequences of those actions, while employing the AI laced AWS in warfare.

It has been argued time and again that there are certain lacunas in the existing legal mechanisms for placing responsibility and holding someone accountable for the deployment of AI weapons in warfare. A fully autonomous weapon itself cannot be accountable for criminal acts that it might commit because it would lack intentionality. In addition, such a robot would not fall within the "natural person" jurisdiction of international courts. More so, it would be unfair to place the liability on human commanders for the wrongful actions of a fully autonomous weapon, except when they could be shown to have possessed the mens rea to commit criminal acts through the autonomous weapons. An alternative approach would be to hold a commander or a programmer liable for negligence of the unlawful acts by robots which were reasonably foreseeable, even if not intended. In such a case the extent of liability placed would not be similar to the one which ought to have been placed on such an individual.

Other than the above mentioned legal framework the following can also be used to regulate the use and deployment of AWS in modern warfare.

16 International Law Commission, 'Draft articles on Responsibility of States for Internationally Wrongful Acts, with commentaries' (2001) YB of the Intl. Law Com. Vol. II, Part 2. P. 88.

17 Any crime consists of two elements: an act and a mental state. A fully autonomous weapon could commit a criminal act (such as an act listed as an element of a war crime), but it would lack the mental state (often intent) to make these wrongful actions prosecutable crimes.

18 ICC Statute, art. 8.

19 ICC Statute, art. 30.

Customary International Law

Customary international law refers to the set of rules that constitute general practice accepted as law other than codified treaty laws. It has two important ingredients: (i) state practice and, (ii) *opinio juris*.²⁰ State practice refers to the widespread practice of particular rules by States over a long period of time in a uniform, consistent and established manner which must be carried out in a manner that instils a belief that it is mandated by the rule of law. *Opinio juris* refers to the subjective acceptance of the practice as law, by the international community.

It is interesting to observe that LAWS are still in the developmental stage. While countries continue to invest in LAWS, there exists a dearth of extensive state practice due to lack of observability hence increased reliance is placed on verbal state practice and *opinio juris* by virtue of Martens Clause.²¹

Martens Clause

It is a unique provision of IHL that establishes a baseline of protection for civilians and combatants when no specific treaty or legal framework exists on a topic.²² It was introduced by Fyodor Fyodorovich Martens and has since been codified in the preamble of the Hague Convention II, 1889²³ and Article 1 of the Additional Protocol II to the Geneva Convention.²⁴ It signifies that, with the technological progression, a point will be reached when machines will be making life and death decisions in armed conflicts without considering the factor of humanity. AWS have to function within the rules of IHL and the additional requirement of Martens Clause.

Martens Clause has two prongs; the principle of humanity and the dictates of public conscience. According to the principles of humanity, AWS have to act as sentient beings and fulfil certain aspects of humanity like humane treatment of others, respect for human life and human dignity by making situation sensitive reasoned decisions and using proportionate force, to prevent arbitrary loss of life and targets. Under the dictates of public conscience, AWS must navigate around moral guidelines based on the idea of wrong and right by inculcating a threshold of legal and ethical judgement to act on a complex case-by-case basis.

With the development of AI in warfare, there is a need to revisit the relevant rules of international humanitarian law in determining how those rules that have been developed to regulate the conduct of States and individuals might extend to the use of AI as it starts assuming the tasks that human beings traditionally performed on the battlefield. It is also important to analyse whether a duty of due diligence applies only to military forces and private individuals within a State's own jurisdiction or extends to individuals under the control or authority of that State such as non-state elements (terrorist groups/ mutants) etc.

20 North Sea Continental Shelf Cases (Federal Republic of Germany/ Denmark; Federal Republic of Germany/Netherlands) [1968] ICJ Rep 9, ICGJ 149 (ICJ 1968).

21 Antonio Cassese, *International Law* (2nd edn, OUP 2005).

22 Centre for Internet Society, 'Legal and Policy Implications of Autonomous Weapons Systems' (CIS, 2020), <https://cis-india.org/internet-governance/legal-and-policy-implications-of-autonomous-weapons-systems>, accessed 26 September 2021.

23 Rupert Ticehurst, 'The Martens Clause and the Laws of Armed Conflict' (ICRC, 30 April 1997), <https://casebook.icrc.org/glossary/martens-clause>, accessed 23 August 2021.

24 Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of Non-International Armed Conflicts, 8 June 1977, 1125 UNTS 609.

International Human Rights Law (IHRL) and AWS

IHRL imposes a responsibility on the States for protection of various rights of its civilian population. It is a field of legal jurisprudence that forces a State to look inwards and assess its obligations towards its own population. While the use of AWS in international warfare have been debated and often looked down upon, the use of AI in domestic law enforcement is viewed as a symbol of the economic and technological advancement of a State. Armed robots (or drones) have already been employed in domestic law enforcement scenarios, as happened in Dallas, in the United States, in 2016, when the police used a Northrop Grumman Remotec Andros, which is a remotely controlled bomb disposal robot, to deliver an explosive that killed an individual who was posing a threat to public order.¹ South Korea currently uses AI robotic weapon system SGR-A1 (developed by Samsung) to guard the demilitarized zone that separate it from North Korea.² Robots are currently employed to patrol borders in other geographic areas, such as the line dividing Israel and Palestine along the Gaza Strip³ which have been used recently in what is being boosted as the world's first AI warfare by Israel (More on this is given in the next section). In May 2017, in Dubai, the first police robot was 'recruited' and unveiled to the world, though it can only perform limited functions, it can still help in identifying wanted criminals and collecting evidence, patrolling busy areas in the city etc.⁴

It is pertinent to state that while such use can be gainful for States with vast population to control or large areas of difficult terrain where human deployment is a risk, this can also cause a potential threat to its own civilian population. The IHRL obligates the State actors to protect the following basic rights of its citizens:

1. **Right to Life**
2. **Right to Bodily Integrity and Privacy**⁵

Right to Life

The right to life is the cornerstone of rules governing the use of force in law enforcement activities. This is the inherent and most basic right that distinguishes modern nations from pre-historic barbaric times. Deprivation of life is only permitted if it happens within a legal framework. The ICCPR and the ACHR employ the term 'arbitrarily' to identify those situations in which the deprivation of life is not tolerated. The ECHR is more detailed: 'No one shall be deprived of his life intentionally save in the execution of a sentence of a court following his conviction of a crime for which this penalty is provided by law'.

1 PW Singer, 'The Police Used a Robot to Kill – The Key questions', (CNN, 10 July 2016), <http://edition.cnn.com/2016/07/09/opinions/dallas-robot-questions-singer/index.html>, accessed on 23 August 2021.

2 A Velez-Green, 'The Foreign Policy Essay: The South Korean Sentry – A Killer Robot to Prevent War' Lawfare (Lawfare, 1 March 2015), accessed on 10 October 2021.

3 James Rogers, 'Robot patrol: Israeli Army to deploy autonomous vehicles on Gaza border', www.foxnews.com/tech/2016/09/01/robot-patrol-israeli-army-to-deploy-autonomous-vehicles-on-gaza-border.html, (Fox News, 1 September 2016).

4 BBC News, 'Robot police officer goes on duty in Dubai' (BBC News, 24 May 2017), www.bbc.com/news/technology-40026940, and Reuters, 'Robocop joins Dubai police to fight real life crime' (Reuters, 1 June 2017), www.reuters.com/article/us-emirates-robocop-idUSKBN18S4K8.

5 Andrea Spangnolo 'Human rights implications of autonomous weapon systems in domestic law enforcement: sci-fi reflections on a lo-fi reality' (QIL, 31 October 2017), <http://www.qil-qdi.org/human-rights-implications-autonomous-weapon-systems-domestic-law-enforcement-sci-fi-reflections-lo-fi-reality/>, accessed on 15 September 2021.

The common denominator of the three major human rights treaties is that deprivation of life can be tolerated only if it has a 'sufficient legal basis', which is the first requirement governing the use of force in IHRL.⁶ A 'sufficient legal basis' represents a demanding test; in fact, the jurisprudence of the ECtHR set the bar high and any law enforcement operation must not only be authorized by law, but also 'sufficiently regulated by it'.⁷

Along with the principle of legality, the principle of strict necessity is of a central importance in the protection of the right to life. A deprivation can have a sufficient legal basis, but nonetheless it can be judged contrary to IHRL if it is not necessary. Necessity means that force should be used only as a means of last resort, when all other non-violent means fail. Such a principle is enshrined in Article 2(2) of the ECHR. It is also important that the force must comply with the principle of proportionality, which requires States' agents to choose means and methods to avoid excessive harm.

Every developed or developing country, which has allowed the punishment that infringes upon this right, has justified this act by some way or another. In India this is a right enshrined under Chapter III, Fundamental Rights of the Indian Constitution under Article 21. Though 'death penalty' is allowed, but it must be 'in accordance with the procedure established by law'. If applied to the use of AWS, the extent of the positive obligation of States to protect the right to life is dependent on the degree of automation of the machine.

It is known, in fact, that IHRL does not merely place limitations on the exercise of States' authority, but it also imposes positive duties on Governments to protect individuals from human right violations, and in particular from violation to the right to life. This obligation applies both when the harmful conduct is performed by a State's agent or by a private person or entity⁸ and extends to 'any activity, whether public or not, in which the right to life may be at stake.'⁹

The positive obligations of States to protect life entail a duty to investigate into an alleged deprivation of life. The draft General Comment on the right to life goes even further by requesting that 'investigations into allegations of violation of article 6 must always be independent, impartial, prompt, thorough, effective, credible and transparent.'¹⁰

If machines are given the power to perform the duties of police officers, it is most likely to be done on the basis of automated processes. For such a decision making, data will be collected, stored, analyzed and used through algorithms. AI would only be able to decide on the basis of software that will help them in predicting the likelihood of a given scenario as they lack the basic elements of empathy, pain, guilt, feeling, emotions, love, care etc that are exclusive to human beings. It is thus reasonable to doubt whether a machine would be able to assess necessity, proportionality and lastly legality of any action. To paint a picture the following scenario can be looked into: A is a thief stealing water for its minor child who will die of thirst if not given water. And B is a thief who is stealing an expensive bottle of perfume from the same multi-functional store. In such a case, for an AI, both A and B are on equal footing i.e. stealing of liquid from a store but for a human policing agency, one is out of need and can be overlooked.

6 Ibid.

7 ECtHR, *Makaratzis v. Greece* App no 50385/99 (ECtHR (GC) 20 December 2004) para. 11; see also *Nachova and Others v. Bulgaria* App no 43577/98 (ECtHR (GC) 6 July 2005) para. 97.

8 Human Rights Committee, 'General Comment No 31. The Nature of the General Legal Obligation Imposed on States Parties to the Covenant', UN Doc CCPR/C/21/Rev.1/Add. 13 (26 May 2004) para. 8. Human Rights Committee, 'CCPR General Comment No 6: Article 6 (Right to Life)' (30 April 1982) para. 3: "The Committee considers that States parties should take measures not only to prevent and punish deprivation of life by criminal acts, but also to prevent arbitrary killing by their own security forces."

9 *Öneryildiz v. Turkey* App no 48939/99 (ECtHR (GC) 30 November 2004) para. 71.

10 General comment No 36 on article 6 of the International Covenant on Civil and Political Rights, on the right to life.

AI cannot be expected to have such nuances in emotional and mental capacity. Therefore the result would be that, if machines would be tasked with law enforcement duties, the life of civilians would be endangered as the decision-making process of machines can be unpredictable and the autonomy exercised by them could have various levels of independence coupled with lack of human understanding.

Right to Bodily Integrity and Privacy

The major issues of concern regarding the right to privacy in the digital age lie with the constant and rapid technological development, which is going to enable individuals all over the world to use new information and communication technologies and at the same time enhance the capacity of governments to undertake surveillance, interception and data collection.¹¹ According to IHRL, limitations on the right to privacy can take place only if States' measures respect the principle of legality, legitimacy and proportionality. The ICCPR in art 17 prohibits 'arbitrary or unlawful interference with privacy'.

It cannot be brushed aside that if AWS were to be deployed for a constant surveillance action then the individuals would be subjected to a constant monitoring and surveillance activity by their Governments, a grave concern, which is being widely debated and discussed all around the world. In India this issue has come up in light of the recent Pegasus Software controversy, wherein allegedly the sitting government has been using this software to spy on various people including Judges and opposition leaders. Such a conduct would probably constitute a 'profiling' activity that according to a Council of Europe recommendation can be defined as: 'an automatic data processing technique that consists of applying a "profile" to an individual, particularly in order to take decisions concerning her or him or for analysing or predicting her or his personal preferences, behaviours and attitudes'.¹²

Profiling of personal data would bear a risk of violating not only the right to life and the right to privacy, but also the right not to be discriminated against.¹³ This right against discrimination is affirmed in all human rights treaties such as Article 17 of ICCPR, Article 8 of ECHR etc. The probability of algorithm based decision making being biased towards certain colour, caste, gender etc. cannot be entirely denied. In such circumstances, the States with definitive legal systems prohibiting any discrimination would be at a higher pedestal of responsibility to avoid any such event of discrimination.

Both the right to life and the right to privacy demand a regulation of the use of AWS in domestic law enforcement that must meet the 'quality of the law' threshold. A threshold that is met by domestic laws that are accessible, that make future Governmental actions predictable and that provide adequate and effective guarantee against abuse.¹⁴

11 UNGA, 'The right to privacy in the digital age' (2014) UN doc A/RES/68/167.

12 Recommendation CM/Rec(2010)13 of the Committee of Ministers to member States on the protection of individuals with regard to automatic processing of personal data in the context of profiling, Adopted by the Committee of Ministers on 23 November 2010 at the 1099th meeting of the Ministers' Deputies. See the Appendix at 1, e).

13 UNCHR, 'Report of the Special Rapporteur on contemporary forms of racism, racial discrimination, xenophobia and related intolerance' (2015) UN Doc A/HRC/29/46.

14 Supra at 48.

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: Convention on Conventional Weapons (CCW Convention)

The CCW, negotiated under the United Nations between 1979 and 1980, finds its roots in the IHL principles and is one of the most relevant instruments used for implementing IHL principles. It has been fundamental in providing a platform for discussion on emerging technologies and AWS since it has a flexible or modular framework which provides adequate space for accommodating future innovations. It recognizes the presence of political inclinations which have an influence in the emerging human-machine interface. It also recognizes the importance of holistic research, development, assessment and the importance of human-in-loop model of AWS.

A discussion on AWS was held at the Fifth Review Conference of the Member States of the United Nations (UN) Convention on Conventional Weapons (CCW). As an outcome of that Conference, an open-ended Group of Governmental Experts was established with the aim of discussing legal issues related to the use of AWS which an informal meeting of experts had already identified in 2016.¹ Such legal issues range from the compatibility of the use of AWS with international humanitarian law (IHL) and international human rights law (IHRL) and all related compliance issues, to more ethical and moral ones.²

Currently there are 125 high contracting parties to the CCW. It is supplemented by additional protocols on specific categories of conventional weapons. This flexibility allows more room for adaptation in the face of technological developments, which may lead to the emergence of new weapons, ammunition, and related military products. The five Additional Protocols to the CCW were adopted by the signatory states to deal specifically with the following types of weapons:

- **Protocol I:** non-detectable fragments (1980);
- **Protocol II:** prohibitions or restrictions on the use of mines, booby-traps, and other devices (1980);
- **Protocol III:** incendiary weapons (1980);
- **Protocol IV:** blinding laser weapons (1995); and
- **Protocol V:** explosive remnants of war (2003).³

1 Final document of the Fifth Review Conference 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 (12-16 December 2016) CCW/CONF/10 Decision 1.

2 Human Rights Watch 'Losing Humanity. The Case Against Killer Robots' (IHRC, 2012), www.hrw.org/sites/default/files/reports/arms1112_ForUpload.pdf, accessed on 10 August 2021.

3 Garcia, Eugenio V, 'Artificial Intelligence, Peace and Security: Challenges for International Humanitarian Law' (IPRI Brasilia, 7 October 2019), SSRN: <https://ssrn.com/abstract=3595340>, accessed on 17 September 2021.

Countries participated in the informal CCW meetings on lethal AWS from 2014. The 2014 meeting was chaired by France followed by Germany in April 2015 and April 2016. However little to no progress was made as decisions were based upon consensus votes and as the name suggests, it was informal. Initially, out of the five permanent members of the UN Security Council, only China was ready to have an open discussion about having an effective framework to regulate the use of AWS in wars. It is the recommendations of the 2017 Report of the Group of Governmental Experts that brought some encouragement after its establishment. This was mostly due to the framing of the problem, although a clear roadmap for international negotiations was still missing. The 2017 CCW report pointed it that IHL should “apply fully to all weapons systems” and that responsibility for the deployment of any weapons system in armed conflict remains with states, which must properly ensure accountability for lethal action in accordance with applicable international law, in particular IHL. While acknowledging the dual nature and rapid development, the report also highlighted the fact that progress in the civilian use of these technologies should not be hindered. Discussions on the characterization of these systems must promote a “common understanding” on their relevant concepts and features and, finally, possible options for addressing the humanitarian and international security challenges posed by emerging technologies in the area of lethal autonomous weapons systems should proceed at this time “without prejudging policy outcomes and taking into account past, present, and future proposals.”⁴

In the CCW meeting held in August 2019, Russia and the United States had opposed proposals to negotiate a new treaty on AWS weapons, calling it a “premature” move. Before the global lockdown the State parties had agreed to hold 20 days of Group of Governmental Experts (GGE) meetings in 2020–2021. The GGE was tasked with developing recommendations regarding a “normative and operative” framework on AWS for the CCW’s Sixth Review meeting conference in December 2021.⁵

In the September 2020 meeting of CCW delegates from 56 out of the 125 state parties had participated. Russia had objected to the hybrid nature of the proceedings and insisted that it had ‘no official status’. Most State parties recognised the need to have human control on AWS and argued that a legally binding instrument would be the most appropriate outcome of international discussions on lethal autonomous weapon system.⁶ The September 2020 meeting on lethal autonomous weapons systems provided an important opportunity for proponents of a new treaty to articulate their support for specific components of the instrument and to identify points of convergence. While these groups will need to reconcile the nuances of their positions, the basic elements of their proposals to prohibit and regulate autonomous weapons systems are the same and can form a solid basis for a new treaty. Identifying such areas of commonality is key to the next step in the process: adopting a negotiating mandate at the Review Conference, or, if that fails, going outside the CCW to adopt a legally binding instrument.⁷

Considering the current patterns of international conflict, in which we are witnessing more and more tragic civil wars, intricate asymmetric conflicts, violent urban battles, and intrastate conflagrations of various kinds, it may well be the case that developing countries and poor regions are likely to be the most affected by future deployments. Such a state of affairs thus calls for a need to have a legally binding instrument on regulation of AWS which makes it mandatory for the State parties to adhere to the recognised principals of IHL and IHRL.

4 Ibid.

5 Convention on Conventional Weapons (CCW) Meeting of High Contracting Parties, “Final Report”, (CCW/MSP/2019/CRP.2/Rev.1) para. 31, <https://reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2019/hcp-meeting/documents/final-report.pdf>, accessed on 30 June 2021).

6 Areas of Alignment’ (Human Rights Watch, 2 August 2021), <https://www.hrw.org/news/2021/08/02/areas-alignment>, accessed on 19 June 2021.

7 Supra 64.

States and Their Stand on AWS

The reasons for specific State parties to support or oppose the idea of using fully AWS in warfare is dependent on the geo-political placement of different State parties. States like Israel and South Korea which have deployed AWS on its borders have been into a continued battle with its immediate neighbour and are under a constant pressure to maintain a combat defence system on its borders. On the other hand, some States are aiming to attain the perfection in AWS in their race towards being the superpowers of the worlds. Such differently placed positions of different State parties, makes their positions on regulation and use of AWS different from each other. In this segment we shall look at the stand taken by different States in their approach towards regulation and use of AWS.

United Nations

Department of Defense Directive (DODD) 3000.09 (the directive), which establishes U.S. policy on autonomy in weapons systems, provides definitions for different categories of AWS for the purposes of the U.S. military. These definitions are principally grounded in the role of the human operator with regard to target selection and engagement decisions, as opposed to the technological sophistication of the weapon system.⁸

DODD 3000.09 requires that all systems, including Lethal AWS, be designed to “allow commanders and operators to exercise appropriate levels of human judgment over the use of force.” Furthermore, “human judgment over the use of force” does not require manual human “control” of the weapon system, as is often reported, but broader human involvement in decisions about how, when, where, and why the weapon will be employed. This includes a human determination that the weapon will be used “with appropriate care and in accordance with the law of war, applicable treaties, weapon system safety rules, and applicable rules of engagement.” To aid this determination, DODD 3000.09 requires that “adequate training, [tactics, techniques, and procedures], and doctrines are available, periodically reviewed, and used by system operators and commanders to understand the functioning, capabilities, and limitations of the system’s autonomy in realistic operational conditions.” The directive also requires that the weapon’s human-machine interface be “readily understandable to trained operators” so they can make informed decisions regarding the weapon’s use.⁹

At the Human Rights Council in May 2013, the United States said that lethal autonomous weapons systems raise “important legal, policy, and ethical issues” and recommended further discussion in an international humanitarian law forum. In August 2019, the US warned against stigmatizing lethal autonomous weapons systems because, it said, they “can have military and humanitarian benefits.” The US regards proposals to negotiate a new international treaty on such weapons systems as “premature” and argues that existing international humanitarian law is adequate.¹⁰

The U.S. government does not currently support a ban on LAWS and has addressed ethical concerns about the systems in a March 2018 white paper, “Humanitarian Benefits of Emerging Technologies in the Area of Lethal Autonomous Weapons.” The paper notes that “automated target identification, tracking, selection, and engagement functions can allow weapons to strike military objectives more accurately and with less risk of collateral damage” or civilian casualties.¹¹

8 Congressional Research Service, ‘Defense Primer: U.S. Policy on Lethal Autonomous Weapons Systems’ (1 December 2020), <https://sgp.fas.org/crs/natsec/IF11150.pdf>, accessed on 21 July 2021.

9 Ibid.

10 ‘Stopping Killer Robots’ (Human Rights Watch, 2 August 2021), <https://www.hrw.org/report/2020/08/10/stopping-killer-robots/country-positions-banning-fully-autonomous-weapons-and>, accessed on 20 July 2021.

11 Supra at 65.

Russia

Russian President Vladimir Putin stated in 2017 that “whoever becomes the leader” in the sphere of artificial intelligence “will become the ruler of the world” and again he advanced as recently as May 18 when he insisted that without artificial intelligence, hypersonic weapons and other new technologies, “it would be impossible to secure the future of our [Russia’s] civilization.”¹²

Russia has consistently opposed proposals to negotiate a legally binding instrument on such weapons or other measures, as it says “existing international law, including international humanitarian law, has some very important restrictions that fully cover weapons systems that have high degrees of autonomy.” In GGE, Russia disagrees that lethal autonomous weapons will be “a reality in the near future”, In November 2019, Russia argued that the concepts of “human control” and “human involvement” involve subjective assessments and are irrelevant.¹³

Regardless of Russia’s actions within the GGE, its actions outside of it spoke volumes as well, as Russia, in 2019, had moved to not only field autonomous icebreakers, but also to create “unmanned aerial vehicles for use in the Arctic”, which could respectively be active for up to 60¹⁴ and four days.¹⁴ Moreover, the Russian government had also initiated use of a system “with artificial intelligence capable of destroying targets selected by pilots without their participation” on Mi-28N attack helicopters, according to TASS,¹⁵ signifying Russia’s attempts at bringing AI into the air as well. Ultimately, however, Russia’s programs that pushes for intense AI development, are severely limited by its extremely small budgetary resources, as Russia’s “military spending on AI is estimated to be as low as \$12.5 million annually, just 0.01 per cent of the unclassified AI budget for the United States military.”¹⁶ This problem is compounded by, according to one survey from 2018, there only being 17 AI enterprises in all of Russia, as opposed to more than 100 in Israel, let alone the over 2000 in the US.¹⁷ Considering the above factors, the stand taken by Russia seems to be primarily motivated by the idea of world dominance unlike South Korea or Israel, where there is a constant engagement with the immediate neighbours.

China

China’s People’s Liberation Army anticipates that AI could fundamentally change the character of warfare even as it fears the emergence of a generational gap between its capabilities and that of the U.S. military. It thus seeks to develop AI and other “strategic front-line” technologies in future military competition with the United States.¹⁸

At the Human Rights Council in May 2013, China supported initiating multilateral talks on lethal autonomous weapons systems, which it described as “highly complex.” China has highlighted the potential for fully autonomous weapons to upset the international strategic balance and affect arms control. In December 2016,

12 ‘The Risks of Autonomous Weapons Systems for Crisis Stability and Conflict Escalation in Future U.S.-Russia Confrontations’ (Russia Matters, 3 June 2020), <https://www.rand.org/blog/2020/06/the-risks-of-autonomous-weapons-systems-for-crisis.html>, accessed on 22 August 2021.

13 Supra at 67.

14 Rajesh Uppal, ‘As Melting Ice Bringing Arctic into Geostrategic Prominence, Russia Quickly Establishes its Military Dominance Over it.’ (International Defense, Security & Technology Inc, 2019), <https://idstch.com/geopolitics/darpa-implementing-us-arctic-strategy-to-counter-russian-dominance-in-arctic/>, accessed 27 July 2021.

15 ‘New onboard system with AI on Mi-28N helicopters capable of destroying targets selected by pilots’ (Russian Aviation, 21 February 2019), <https://www.ruaviation.com/news/2019/2/21/12985/?h>, accessed 27 July 2021.

16 Haner J. and Garcia, D., ‘The Artificial Intelligence Arms Race: Trends and World Leaders in Autonomous Weapons Development’ (2019) 10(3) Global Policy 331,337, <https://onlinelibrary.wiley.com/doi/epdf/10.1111/1758-5899.12713>, accessed 21 July 2021.

17 China Institute for Science and Technology Policy at Tsinghua University, China, A.I Development Report (2018) 46, https://indianstrategicknowledgeonline.com/web/China_AI_development_report_2018.pdf, accessed 21 July 2021.

18 Supra at 68.

China said that such weapons “present considerable uncertainties” for compliance with international humanitarian law and expressed its desire for precautionary measures, highlighting the precedent provided by the ban on blinding lasers. In April 2018, China called for a ban on fully autonomous weapons, but later clarified that its call was limited to use only and not development and production. Since then, China has not explicitly repeated its call for a new international treaty to ban fully autonomous weapons.¹⁹

Israel

The Israel Defence Forces (IDF) of Israel that carried out the recent operation ‘Guardian of the Walls’ said that it relied heavily on machine learning and data gathering. During the two-week war between the IDF and the Hamas, IDF carried out focused air strikes on the rivals, established deep within Gaza, killing at least 100 of their top operatives. The infrastructure built in the Gaza strip, by the Hamas and the Islamic Jihad, was destroyed by Israeli jets.²⁰ Palestinian health officials claimed Israeli attacks on Gaza killed innocent civilians including children, drawing condemnation from countries across the Arab world and human rights groups.²¹

In November 2013, Israel said that lethal autonomous weapons systems “do not exist currently.” It has urged states to keep “an open mind regarding the positive capabilities of future lethal autonomous weapons systems”, as it finds that they “might ensure better compliance with the laws of armed conflict in comparison with human soldiers.” Israel has rejected calls to negotiate a new international treaty to ban or restrict fully autonomous weapons. It is developing, testing, producing, and using weapons systems with autonomous functions.

India

Autonomous weapons are a subject of major controversy all around the globe. This controversy is because of the ethical, moral and legal dilemma presented by the question “whether algorithms should have the authority to determine who to kill and execute the killing without any material human supervision?” States, as well as experts, are sharply divided on the issue of a pre-emptive ban on AWS. On the one hand, Human Rights Watch (“HRW”), various non-governmental organizations and the majority of states²² which are party to CCW are strongly endorsing a ban on AWS. Their major argument is that these weapons are illegal since they would be incapable of abiding by the key principles of international humanitarian law (As discussed in the previous section). On the other hand, global powers like US, UK and some scholars like Michael Schmitt,²³ a professor at the US Naval War College argues that the ban would be pre-mature and against technological advancement.²⁴

Interestingly, India has a ‘wait and watch’ approach on AWS as indicated during the 2016 United Nations Conference on Disarmament (“CD”). Despite maintaining that LAWS should be in compliance with International Humanitarian Law, India refrained from taking a firm stand on LAWS stating that it was too soon to jump to a definitive conclusion.²⁵ This was followed by other similar stances taken at various international

¹⁹ Supra at 67.

²⁰ ‘Israel Claims to Have Fought the World’s First AI War’ (INDIAai, 1 June 2021), <https://indiaai.gov.in/news/israel-claims-to-have-fought-the-world-s-first-ai-war>, accessed 21 July 2021.

²¹ Takeshi Kumon, ‘The first AI conflict? Israel’s Gaza Operation Gives Glimpse of Future’ (Nikkei Asia, 28 June 2021), <https://asia.nikkei.com/Politics/International-relations/The-first-AI-conflict-Israel-s-Gaza-operation-gives-glimpse-of-future>, accessed 17 August 2021.

²² ‘Country Views on Killer Robots’ (Campaign to Stop Killer Robots, 7 July 2021), https://www.stopkillerrobots.org/wp-content/uploads/2020/05/KRC_CountryViews_7July2020.pdf, accessed 17 August 2021.

²³ Schmitt, Anderson and Waxman, Rebecca Crootoof, ‘The Killer Robots Are Here: Legal and Policy Implications’ (2015) 36 *Cardozo Law Review* 79.

²⁴ Damien Gayle, ‘UK, US and Russia among Those Opposing Killer Robot Ban’ *The Guardian* (Europe, 29 March 2019), <https://www.theguardian.com/science/2019/mar/29/uk-us-russia-opposing-killer-robot-ban-un-ai>, accessed 17 August 2021.

²⁵ ‘Statement by PR to CD at the CCW Informal Meeting of Experts on Lethal Autonomous Weapons Systems’, (Permanent Mission of India to the Conference on Disarmament Geneva, 11 April 2016), <https://eoi.gov.in/eoisearch/MyPrint.php?4829?001/0002>, accessed 21 August, 2021.

fora and domestic platforms. In March 2019, in a Statement to the Convention on Conventional Weapons Group of Governmental Experts on lethal autonomous weapons systems, India said that “responsibility for development, production and deployment” of LAWS “should rest with the concerned state” but “associated risks as regards proliferation (including to non-state actors), need to be covered under dual responsibility of the state and by strengthening international regulations.”²⁶

As a net importer of arms, India needs to keep its defensive and offensive capabilities at par with its neighbours.²⁷ India cannot afford to fall behind in the AWS race for national security and trade considerations. In addition to state powers, India also has to contend with non-state actors within its border. This necessitates the utilization of some sort of artificial intelligence powered systems to ensure both operational preparedness, as well as to mitigate loss of life of its armed forces stationed in extremely inhospitable terrains. In view of the global technological advancements, India’s position is expected to be in line with the manner of growth of asymmetric warfare globally and development undertaken by countries in possession of Autonomous Weapons System technology.

At the UN General Assembly in October 2013, India supported a proposal to begin multilateral talks on lethal autonomous weapons systems. India has stated several times that challenges over such weapons must be resolved “in a manner that does not further widen the technology gap between states or encourage the use of lethal force to settle international disputes.” India has expressed concern that using the concept of meaningful human control could risk legitimizing such weapons systems. In March 2019, India said that “responsibility for development, production and deployment” of lethal autonomous weapons systems “should rest with the concerned state” but also said that “associated risks as regards proliferation (including to non-state actors), need to be covered under dual responsibility of the state and by strengthening international regulations.” India is investing in the development of various autonomous weapons. However, in September 2019, Defense Minister Rajnath Singh reportedly stated that “the final attack decisions should be made by humans in the military, not by artificial intelligence.” India participated in every CCW meeting on killer robots in 2014-2019 and chaired the CCW meetings in 2017–2018.²⁸

It is important to be pragmatic about developing LAWS in tandem with respecting the standards of IHL keeping in mind India’s National Security. The need of the hour is to establish a clear strategy on LAWS for India to be at the top of the game despite recognizing the need to control and regulate the AI interface in warfare. The advent of the new Drone Rules in 2021 has also contributed towards India’s stance and position towards these weapon systems.

In a significant regulatory breakthrough, the Government of India has revamped the civil drone framework in India and notified the Drone Rules, 2021 (“**New Rules**”). The New Rules supplant the widely panned and overly restrictive Unmanned Aircraft System Rules, 2021 (“**Earlier Rules**”), which were published in March 2021. The Government has now greatly liberalised the drone regime, removing specific prohibitions on foreign-owned and controlled Indian companies and streamlining the drone registration and certification process, among other things, under the New Rules. Below are some of the important characteristics of the New Rules that will now regulate the civil use of drones in India.²⁹

26 Ministry of External Affairs, Government of India, ‘Statement to the Convention on Conventional Weapons Group of Governmental Experts on lethal autonomous weapons systems’ (26 March 2019), <https://eoi.gov.in/eoisearch/MyPrint.php?7927?001/0002>, accessed 21 August, 2021.

27 Special Correspondent, ‘India is the World’s Second Largest Arms Importer’, The Hindu (12 March 2019), <https://www.thehindu.com/news/national/india-is-worlds-second-largest-arms-importer/article26502417.ece>, accessed 21 August, 2021.

28 Supra 67.

29 ‘Drone Regime in India Significantly Liberalised: Entry of Foreign Players Permitted’ (National Law Review, 3 September 2021), <https://www.natlawreview.com/article/drone-regime-india-significantly-liberalised-entry-foreign-players-permitted>, accessed on 10 October 2021.

Drone Rules

Applicability

A “drone” is described in the New Rules as an “unmanned aircraft system” (“UAS”) which is defined as “an aircraft that can operate autonomously or remotely without a pilot on board.” The New Rules apply to all (i) UAS registered in India; (ii) persons who own or hold a UAS in India or engage in leasing, operating, transferring, or maintaining a UAS in India; and (iii) all UAS currently operating over or in India. Furthermore, the New Rules only apply to civil usage of drones and exclude the application of the 1937 Aircraft Rules³⁰ to drones weighing up to 500 kg.

Categorisation and Classification of UAS

The New Rules categorize UAS into **aeroplane, rotorcrafts** and **hybrid unmanned aircraft systems**. These categories are further sub-categorized as the following:

- **Remotely piloted aircraft system (“RPAS”)**: This includes a remotely piloted aircraft, its associated remote pilot stations, the required command and control links and any other components as specified in the type design.
- **Model RPAS**: These are RPAS which have a maximum all-up weight of 25 kgs, which are used for educational, research, design, testing or recreational purpose only and operated within visual line of sight.
- **Autonomous UAS**: Unlike the Earlier Rules, the Rules do not define autonomous UAS. Hence, the degree of autonomy that would be required for a UAS to be considered as autonomous would need to be evaluated further.

Furthermore, the classification of drones under the New Rules is similar to that of the Earlier Rules (i.e., weight-based classification)⁵, with one exception: under the Earlier Rules, Nano Drones would be classified as Micro Drones if they exceeded the stipulated performance parameters based on the maximum speed, height, or range attainable from the remote pilot (i.e. performance-based classification). The New Rules have eliminated this performance-based reclassification of Nano Drones, which will benefit the whole sector.

Registration

Drones must also be registered on the Platform and assigned a UIN before they can be used, according to the New Rules. Once the required details of the individual/organization and the drones are submitted during the application process, the Platform will validate the details and issue a UIN to the applicant. Furthermore, any transfer of drones, whether by sale, lease, gift, or otherwise, must be recorded with the platform. Unlike the type certification process, there does not appear to be a timetable for the Platform to conduct the registration, and it is unknown whether the Platform will physically check the drone and the applicant. However, the view of drone experts is that these detours should be avoided.

³⁰ Aircraft Rules 1973.

A drone's UIN must be linked to the "unique serial number" provided by the manufacturer, as well as the flight control module and remote pilot station. However, the New Rules do not specify whether the unique serial number will be supplied by the makers themselves or by the authorities to each manufacturer. The New Rules forbid replacing the flight control module and remote pilot station without first updating the unique serial number of each with the digital sky Platform within 7 days of such replacement or before the drone is operated, whichever comes first.

Drones built in or imported to India on or before November 30, 2021 have a window until December 30, 2021 to register on the Platform and get a UIN. If the drone has (i) a valid Drone Acknowledgement Number provided by the Platform before November 30, 2021; or (ii) a paid Goods and Services Tax invoice for the drone; or (iii) is on the platform's list of UAS, the Platform will issue a UIN for the drone.

Relaxations on Foreign Companies

The previous rules imposed particular limits on foreign corporations or their majority/wholly owned Indian subsidiaries owning/operating/manufacturing/dealing with drones in India. The government has lifted the ban on foreign-owned and controlled Indian businesses ("FOCC") conducting drone operations in India. As a result, for the first time since the sector was controlled, the drone regime has been liberalised, allowing FOCCs, among other things, to manufacture and operate drones in India. The deregulation is anticipated to attract international investment, as well as safer and more advanced technology for drones, which would otherwise be required.

Operation of UAS

The permissions required for drones has also been relaxed to a great extent. The Government will notify an interactive map by September 25, 2021 which is proposed to be accessible through a machine-readable API. The map will divide the entire Indian airspace into three zones namely:

Green:

Includes (a) the airspace up to a vertical distance of 400 ft or 120 m for all zones which have not been categorised as red or yellow; and (b) the airspace up to a vertical distance of 200 ft or 60 m above the area located between a lateral distance of 8 kms and 12 kms from the perimeter of an operational airport.

Yellow:

Includes (a) the airspace above 400 ft or 120 m in the designated green zone and (b) the airspace above 200 ft or 60 m in the area located between the lateral distance of 8 km and 12 km from the perimeter of an operational airport

Red:

Will include areas notified by the Central Government and may include installations, port limits or areas beyond territorial waters of India.

The Rules provide that no permission is required for drone operations in the green zone, as long as the remote pilot self-verifies the Platform for limits on the desired area of operations. As a result, operations in the green zone would only require a type certificate and a UIN, which would be one-time procedures. Operations in the yellow and red zones, on the other hand, require approval from the air traffic control authority and the Central Government, respectively. As a result, the government appears to have taken a pragmatic approach that considers security issues while not imposing prohibitive constraints. From a safety perspective, the Rules also put the onus on the drone operator to ensure that the operations do not, whether directly or indirectly, endanger the safety and security of any person or property.

Autonomous and BVLOS operations

Except for Model RPAS, there are no specific limits or licences necessary for beyond visual line of sight (“BVLOS”) operations in the New Rules. Due to the lack of advice on BVLOS activities, numerous industry participants may find it difficult to plan their future course of action, as any subsequent change in rules might have a significant impact on R&D operations as well as business plans. As a result, it is suggested by experts that some recommendations be supplied for such operations.

Carriage of Payloads

Except for the forbidden items indicated above, there are no guidelines on payload transport. This could be a problem for companies considering commercial usage of drones for deliveries and logistics. There is little clarification on the type of carriage that would be permitted in the lack of rules, nor on whether it would include BVLOS carriage as well. As a result, businesses are finding it difficult to plan their activities in this area, and further regulatory developments in this area must be examined.

Model RPAS Operations

Model RPAS are restricted-use drones that can only be used for educational, research, design, testing, or recreational purposes. They must not weigh more than 25 kg and must only be used within visible range. Model RPAS, as previously stated, do not require a type certificate; nevertheless, such drones do require a UIN.

Research and Development

The Earlier Rules featured extremely stringent restrictions governing the conduct of research, development, and testing (“R&D”) operations, requiring authorization even before R&D began. The New Rules have also drastically relaxed this requirement, allowing any drone producer with a GST identification number to perform R&D without the need for a type certificate, UIN, previous approval, or even an RPL. Furthermore, R&D operations can only be carried out in a green zone and either on the premises of the person carrying out the operations or in an open space in a green zone under the jurisdiction of such person.

Import of UAS

The New Rules provide that the import of unmanned aerial systems (UAS) will be regulated by the Directorate General of Foreign Trade or any other agency authorised by the Central Government. The import of UAS is “Restricted”¹⁰ and necessitates DGCA permission and an import licence from the DGFT. Nano Drones that operate below 15 metres above ground level are exempt from this requirement, but they must obtain an Equipment Type Approval from the WPC Wing of the Department of Telecommunications (“DoT”) in order to operate in de-licensed frequency band(s) in accordance with telecom requirements. It remains to be seen whether the performance-based restriction on Nano Drones, which is a holdover from the Earlier Rules, will be maintained in light of the new rules.

Remote Pilot and Training Organisations

Except for operating a Micro Drone for non-commercial purposes, Nano Drones and R&D purposes, all drone operations require the pilot to be a holder of a valid remote pilot license (“RPL”). Individuals are eligible to apply for an RPL only if: (i) they are aged between 18–65 years of age; (ii) have passed grade 10th examinations or equivalent; and (iii) have completed the training specified by the DGCA from an authorised remote pilot training organisation (“RPTO”). The individual must also pass the application is required to be made to the DGCA on the Platform and the DGCA will process the same within 60 days. Once granted, the license will be valid for 10 years and can be renewed for a further period of 10 years thereafter.

Safety Concerns

While the New Rules encourage various stakeholders to investigate and expand the drones sector, there appears to be a general absence of framework addressing drone activities in terms of safety and security. Once a type certificate and UIN have been obtained, drones may be operated freely in green zones, which may include heavily populated civilian areas in the lack of further guidance. While there is a reporting requirement for drone accidents, there may be additional precautions to prevent such mishaps from occurring in the first place. For example, it is unclear whether there will be a check on drone operations based on the type certificate. Furthermore, when it comes to payload carriage, it is not simply explicitly harmful commodities that can risk life or property during drone operations. Even very light objects can inflict injury and damage at the height at which drones operate if they are dropped from the drone for any reason.

Penalties

Notably, the New Rules only criminalise the transport of weapons and explosives, as well as the use of drones contravention is proven to have been caused by factors or circumstances beyond the relevant person’s control or without the relevant person’s knowledge or fault, such as stress of weather, or any other unavoidable cause or circumstances. This, of course, does not absolve liability under other laws. A maximum penalty of INR 1 lakh (about USD 1350) has been prescribed for any other violation of the New Rules.

Key Takeaways

The guidelines are meant to make Ease of doing business in the industry more quicker by decreasing the number of clearances and compliance requirements for registration, as well as the costs that must be paid. Drones will also be considerably easier to own and operate with a single window clearance. A number of onerous hardware and software requirements imposed in prior versions of the regulations, including as geo-fencing capability, No Permission No Takeoff compatible hardware, and a 360-degree collision avoidance system, have been removed from the guidelines. At the moment, this makes it easier for drones to be certified for operation. These laws, however, provide room for the government to add standards for safety elements at a later period. These requirements must be met within 6 months after being notified. This may present difficulties for drone operators operating drones that lack certain features, as they will need to be either made compliant or scrapped.³¹

From the Drone Rules, 2021, the government has omitted a lot of information contained in prior revisions of the regulations. The scope of permitted drone activities, as well as the commercial viability of specific types of drone operations, will be determined by further regulations that the government may issue.

All in all, the New Rules are poised to transform India's drone industry in the next years. There is potential for economic growth not just within the sector, but also in other sectors as a result of increased data availability, lower logistical costs, new age technology, intellectual property, and so on. We anxiously await the benefits of the drone world, but we must also construct a thorough framework to assure safety and security.

31 Rajagopalan, R.P. & Krishna, R. (2019). India's Drone Policy: Domestic and Global Imperatives. ICAO Scientific Review: Analytics and Management Research, 1, 53-68, <https://www.informingscience.org/Articles/v1p053-068Rajagopalan5144.pdf>, accessed on 12 October 2021.

Conclusion

There are two predominant positions with respect to the treatment of LAWS in international sphere: one set of countries are calling for a pre-emptive ban on all LAWS, while the other set are opposing it and instead advocating for regulations and transparency.

Movements to Ban LAWS

Today, there are around 30 countries and 165 NGO's that have advocated for a pre-emptive ban on LAWS, citing ethical concerns.¹ They think that the safety related risks that come from the utilization of LAWS, and the added concerns about compliance with the proportionality and distinction requirements of International Humanitarian Law are high enough to warrant a complete pre-emptive ban on all LAWS.

Similar sentiments are also echoed by experts including artificial and robotics researchers, and the general public. The Holy See, faith leaders and Nobel Peace Prize laureates have expressed moral outrage at the prospect of losing human control over the use of force.² Civil society and the International Committee of the Red Cross have emphasized that law and ethics require human control over the critical functions of a weapon.³ This lack of human control in the use of force is the primary driving force behind arguments to ban LAWS. The other arguments relate to safety risks that arise in operational use like hacking, malfunctions and errors, which will be made graver by the lack of human intervention in the kill chain. International Humanitarian Law, and the principles of the Martens Clause too have also been cited in this regard.

However, there are also countries that oppose these pre-emptive bans on LAWS. Most of these are developed countries, and cite civilian uses of LAWS as a reason for not stopping research work related to the field. They also talk of the utility of such weapons in harsh and inhospitable terrains, and list the benefits it has in terms of reduction of human casualties. Further, they also say that LAWS have humanitarian benefits, as they can be more precise than humans and thus reduce collateral damage in warfare.

Movements to Regulate LAWS

Since 2013, the United Nations' Convention on Certain Conventional Weapons in Geneva has been the primary forum for discussions on LAWS.⁴ These discussions have resulted in a list of eleven non-binding Guiding Principles on LAWS which were affirmed by the Group of Governmental Experts on Emerging

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- 1 Congressional Research Service, 'Defense Primer: U.S. Policy on Lethal Autonomous Weapon Systems' (1 December 2020), <https://crsreports.congress.gov/product/pdf/IF/IF1115>, accessed 23 August 2021; Brian Stauffer, 'Stopping Killer Robots- Country Positions on Banning Fully Autonomous Weapons and Retaining Human Control' (Human Rights Watch, 10 August 2020), <https://www.hrw.org/report/2020/08/10/stopping-killer-robots/country-positions-banning-fully-autonomous-weapons-and>, accessed 23 August 2021.
 - 2 Kelley M. Saylor and Michael Moodie, 'International Discussions Concerning Lethal Autonomous Weapon Systems' (Congressional Research Service, 19 April 2021), <https://fas.org/sgp/crs/weapons/IF11294.pdf>, accessed 23 August 2021.
 - 3 International Committee of Red Cross, 'Autonomous weapon systems: Implications of increasing autonomy in the critical functions of weapons, 2016 — report of an expert meeting' (12 June 2020), <https://www.icrc.org/en/publication/4283-autonomous-weapons-systems>, accessed 23 August 2021.
 - 4 Group of Governmental Experts 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 (UN Office of Disarmament Affairs, 20 July 2020), <https://www.un.org/disarmament/events/group-of-governmental-experts-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-injur-2/>, accessed 23 August 2021.

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Technologies in the Area of Lethal Autonomous Weapons Systems.⁵ These Principles affirmed that international law, in particular the United Nations Charter and International Humanitarian Law as well as relevant ethical perspectives, would guide the continued work of the Group.

In 2021, the goal of the CCW was to use these guiding principles to create a normative and operational framework, which could be a legally or politically binding document. It would cover the positive obligation of human control over anti-personnel weapons and also prohibit weapons incapable of meeting the control requirement.⁶ Such a movement is a step in the right direction, but the focus should remain on producing a treaty or regulations that would impose binding obligations on all State Parties to not violate IHL in their pursuits. This might be opposed by some nations like China, Russia and the USA, which needs to be accounted for as well.⁷

Alternative Opinions — Enhancing Transparency

An alternative to an outright ban has also been proposed as per which the focus of the global community should lie on enhancing transparency in weapons development and sharing best practices for weapons review processes. This would result in less asymmetry in weapons caches, and significantly reduce the possibility of a global arms race for LAWS. France and Germany have proposed issuing a non-legally binding political declaration affirming that IHL applies to LAWS and that “States Parties share the conviction that humans should continue to be able to make ultimate decisions with regard to the use of lethal force and should continue to exert sufficient control over lethal weapons systems they use.”⁸ This could help assuage fears about the possible violations of International Humanitarian Law, but the non-legal nature of the declaration doesn’t inspire much confidence.

5 ‘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, 15 November 2019), <https://undocs.org/CCW/MSP/2019/9>, accessed 23 August 2021.

6 Background on LAWS in the CCW’, (UN Office for Disarmament Affairs, 20, July 2020), <https://www.un.org/disarmament/the-convention-on-certain-conventional-weapons/background-on-laws-in-the-ccw/>, accessed 23 August 2021.

7 Supra at 92.

8 Kelley M. Saylor and Michael Moodie, ‘International Discussions Concerning Lethal Autonomous Weapon Systems’, 19 April 2021, Congressional Research Service, <https://fas.org/sgp/crs/weapons/IF11294.pdf>, accessed 23 August 2021.

Recommendations

It is time for different countries to come together in search of a solution for the increasing use and threats of Autonomous Weapon Systems. Some steps that the global community can take in this regard include:

- a. Negotiating a new protocol prohibiting fully autonomous weapons systems, or lethal autonomous weapons systems.
- b. Presenting clear national positions and to reach agreement on the need to adopt a negotiating mandate.
- c. Adopting national prohibitions as key building blocks for an international ban.
- d. Reflecting and implementing Marten's Clause's moral and legal grounds to further to develop the existing public conscience.
- e. Opposing the removal of meaningful human control from weapons systems and the use of force.
- f. Adopting codes of conduct, statements of principles and other measures that ensure the private sector does not advance the development, production or unrestricted use of fully autonomous weapons.

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