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The Regulation of AI-Based Weaponry under International Humanitarian Law

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ABSTRACT

This decade has seen a remarkable advent of artificial intelligence in warfare. The present (and recently past) wars are using complex machine learning technology to fight the opponent. There are of course humanitarian aspects and concerns to this movement. This research paper explores the complex narrative of AI in armed conflict, focusing the usage of smart Autonomous Weapons Systems (AWS) and its impact on the working of International Humanitarian Law ('IHL'). The technology is still new and there is unpredictability in its usage and if it can indeed be used fairly. However, this paper in caution, argues against an absolute prohibition of such AI-enabled technology, as an excessive control on the weaponry might hinder the potential benefits it carries, especially towards efficient wars with minimal intended or unintended casualties. Instead, this paper proposes that these machine learning weapons duly comply with the IHL rules to the fullest extent. For this, the paper shall focus on the principle of obligation of constant care under IHL and how it could help hammer out specific mitigatory and precautionary obligations. There is of course the battle with the ambiguity in International law, especially surrounding the "constant care" standard and this paper discusses that too. The ultimate goal is to find a balance between technology and ethics and the human values of peace, applied to a world of machines.

Keywords: AI, AI-warfare, Machine Learning, International Humanitarian Law, and Constant Care Obligations.

I. INTRODUCTION

(A) The Warfare Landscape

The contemporary landscape of warfare around the world is undergoing an unprecedented change: from mechanical inclusions to efficiency and such, there is a now a huge assimilation of artificial intelligence (AI) that changes the technology from the very fundamentals. This would surely set as one of the profound milestones shifts in the historical database of weaponry and war alike. However, AI technology has entered in multiple ways into our wars. The central focus of this research paper is the transformative inclusion of AI technology through machine

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learning technology in weapons.[2] It revitalizes the mechanics of the weapon and comes with a dynamic force that manages to progressively automate decisions, including many of the crucial ones involving the life-or-death decisions under an armed conflict (on and off the war field and occupation). Yet, this technology is understandably new and there are no effective codes around its usage (if any). Hence, such integration faces a complexity that involves questioning the very nature of machine learning systems and their need to be constantly in a state of "learning" and adaptation. This makes their usage unpredictable. If a technology is learning on the job, it is a very job to come out with usage predictions and importantly, the explanations later on for their decisions of the machine. This anxiety has understandably sparked discussions regarding the alignment of these 'Autonomous Weapons Systems (AWS)' with the principles and tenets of already existing body of international humanitarian law (IHL).[3]

(B) The state of AWS v. IHL

As an introductory note, it is important that this fight between AWS and IHL be fleshed out, before being explored in a deeper manner. The fight is simply this – there is a large faction of scholars, industry experts, and diplomats calling for strict and outright prohibition of machine learning weapons in warfare of all kinds. However, as stated in goals of the paper above, this research paper does not endorse such a strict position. Instead, it puts forth the need for a much nuanced and comprehensive perspective that takes into account the pros of using this technology in warfare too.[4] That is, instead of endorsing the faction that asks for a unyielding prohibition and strong control, this research paper believes that the outright ban on machine learnt weaponry would hamper all the potential advantages that the technology might hold, for example, helping minimizing casualties during armed conflicts on and off the field. Instead, this paper posits, that the goals of the discussions around AWS v. IHL should lie in a nuanced theoretical and practical debate that consider the ways of responsible and ethical deployment of machine learning weapons and harmonize use cases of AWS with the fundamental principles of IHL.[5] However, this theory or goal is easier stated in a sentence than actually unpacked. Hence, to navigate this complex terrain of questions and ethical considerations, the coming sections of this paper shall delve into each side of the debate – first, the limitations that are inherent in arguments for

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[2] M. Munir, "Autonomous Weapons Systems: Taking the Human Out of the Loop," SSRN 4074072 (2022).

[3] Katari, S. R., "From Algorithms to Accountability: Regulating Autonomous Weapon Systems in the Face of Ethical and Legal Challenges," 3 Jus Corpus LJ 95 (2022).

[4] Acquaviva, G., "Autonomous weapons systems controlled by Artificial Intelligence: a conceptual roadmap for international criminal responsibility," 60.1 The Military Law and the Law of War Review 89-121 (2022).

[5] Roff, H. M., & Moyes, R., "Meaningful human control, artificial intelligence and autonomous weapons," Briefing Paper Prepared for the Informal Meeting of Experts on Lethal Autonomous Weapons Systems, UN Convention on Certain Conventional Weapons (2016, April).

absolute prohibition, then, study the challenges that arise in establishing liability (general and for AWS) under IHL regimes,[6] like that of International Criminal Law (ICL) or the principles of core obligation of constant care within the IHL itself. The paper would undertake a critical examination of the existing legal and moral landscape and most primarily, the judicious integration of AI in warfare. The paper constantly seeks to highlight the need for a balanced approach in this AWS v. IHL debate; an approach that not only acknowledges the profound (and frankly, necessary) technological advancements that AI brings to weaponry while also making sure that the ethical imperatives enshrined in international humanitarian principles do not die off in the race for efficiency.[7]

(C) Research Questions:

1. Whether there are potential benefits of the AWS systems that overpower the harms and threats these systems bring?

2. Whether there are pockets within the International Humanitarian Law to meaningfully regulate new age ai-enabled, autonomous learning weapons?

In light of the above research questions, this is how the paper seeks to proceed - after having delineated the premise and the key substantive points in the abstract above and this introductory section, the paper would straightaway dive into Part B where the arguments against prohibition will be discussed. Part B shall lay out the anxieties that prohibitions seeking factions have with the autonomous systems and why these are justified and how these are can be handled by careful reading of the present legal framework. Part C will then move on to discuss the moral precepts of law that apply generally to armed conflicts and wars in general. The Part D shall move on to discuss the flaws of the law itself and the relative unpredictability that clouds all law, especially the international law standards that apply (or might apply) to autonomous weapon system. Thereafter, Part E again moves into the legal discussion over these systems. The range of precautionary principles, this paper argues, are strong enough to put serious obligations on all state parties and combatants in an armed conflict to abide at least to certain basis human values. Finally, Part F and G are aimed at providing solutions to this problem of AWS v. IHL and concluding the discussion threads of this research paper.

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[6] Abaimov, S., and Martellini, M., "Artificial intelligence in autonomous weapon systems," in 21st Century Prometheus: Managing CBRN Safety and Security Affected by Cutting-Edge Technologies (2020) 141-177.
[7] Tzimas, T., and Tzimas, T., "AI and International Security-the Case of AWS'and Collective Security System," in Legal and Ethical Challenges of Artificial Intelligence from an International Law Perspective (2021) 149-165.

II. THE ARGUMENT AGAINST PROHIBITION

Let's first start with the side of the debate that calls for absolute prohibition on such technology in the weaponry of the times.

The faction that calls for the absolute prohibition of machine learning weapons develops its arguments under the very basics of international humanitarian law (IHL) that is, the inherent unpredictability in the use case of these weapons (as the introductory section above also highlighted). These systems are obviously continuously "learning" and there is no saying how they might react or *why* indeed they reacted in the way that they did. However necessary this anxiety is, it can be quelled by looking at this debate in the light of potential physical and moral advantages such ai-technology could offer to the weapon. A much stated example of this advantage could be that weaponry equipped with this technology would be far more efficient in seeking targets and eliminating them, and causing far less second-hand exposure or damage to the things surrounding it, thereby, reducing the casualties caused, specially of civilians and non-combatants during the armed conflicts on and off the field. Hence, arguing for prohibiting machine learning weapons solely on the fact that there is a perceived or possible unpredictability of result is weak. It requires a trade-off analysis that involves an exploration of the question of whether achieving a meaningful human control over the weapon is a realistic goal or not and whether in this control, can we still find the moral and ethical space to make sure it is IHL compliant.[8]

Another important discourse revolving around the above stated prohibition principle is the one that has a deep need for adherence to the age-old warfare axiom "the more control, the better." They stated that certain automatic machine systems, when adhering to clear, pre-stated, deterministic rules such as "if X, then Y," are able to exhibit inherent predictability in use case and their results. That, is indeed true. However, it is not an autonomous system that learns by itself anymore and becomes something part of the present human-enabled technology instead. In a stark contrast, the future of present machine learning systems would more likely be (and should be) characterized by on-spot, continual adaptation, which brings those efficiency gains that we talked about above.[9] "The more control, the better" does not work well for efficiency of these technologies and there is an unavoidable element of unpredictability that needs to be made peace with.[10] However, the axiom followers derive their understandings and legitimacies

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[8] Moyes, R., & Geiss, R., "The exercise of human control from legal, ethical and operational perspectives."

[9] Usman, H., Tariq, I., and Nawaz, B., "In The Realm Of The Machines: Ai's Influence Upon International Law And Policy," 4 Journal of Social Research Development 383-399 (2023).

[10] Haarhoff, E., "Embracing artificial intelligence by placing limitations on autonomous weapons" (2022).

from the tenets of liability under International Criminal Law (ICL) itself, which traditionally states that in an armed conflict, the combatants are responsible for the reasonably foreseeable consequences that arise out of their actions; this is simply not applicable for AWS and hence, the fear against their usages in this faction (thus the call for absolute prohibition). The argument does hold certain merit.[11] For example, consider a deterministic Autonomous Weapons System (AWS) that is programmed for use cases in normal conditions by human beings. It is capable of impeccably meeting all IHL requirements during its normal functioning in an armed conflict (i.e., with the programmed use cases).[12]

However, there would be times when the machine would have to be left to its our device, and in that event, if there is a decision made by the machine that leads to say, civilian harm, the inherent unpredictability of the decision making within machine learning system makes it highly impossible to foresee such failures or decisions. Hence, under the present international regime (especially the criminal one), assigning responsibility on the machine (or its makers or its users) ex post facto the act becomes a challenging task. This raises critical concerns about accountability and liability in such instances of unpredictable nature of machine learning outcomes and unintended consequences in a conflict.[13]

III. THE MORAL PRECEPTS OF LAW

The argument remains – there needs to be a thorough reevaluation of the conventional international law paradigm and arguments advocating for absolute prohibition of ai-tech in weaponry.[14] That is, rather than fixating on this goal or that or the elusive goal of absolute control, we need to embrace the potential benefits of machine learning technology. This can be done by providing some security to the axiom supporters.[15] This can in turn be done by tapping into the relevant provisions of international law regime that underscore the nuances of machine learning systems' capabilities and their potential contribution to a more robust application of the fundamental IHL principle of military necessity. One great starting place for this purpose would be the Article 57(1) and all the sub-articles of 57(2) of Additional Protocol I to the Geneva Convention. It states:

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[11] Pacholska, M., "Military Artificial Intelligence and the Principle of Distinction: A State Responsibility Perspective," 56.1 Israel Law Review 3-23 (2023).

[12] Hoffberger-Pippan, E., "Rethinking Norms in Times of Algorithmic Decision Making?–A Kantian Approach," 4 Journal of Ethics and Legal Technologies JELT-Volume 4 Issue 1 (2022) 65-90.

[13] McFarland, T., "Minimum levels of human intervention in autonomous attacks," 27.3 Journal of Conflict and Security Law 387-409 (2022).

[14] Humble, K., "Artificial Intelligence, International Law and the Race for Killer Robots in Modern Warfare," in Artificial Intelligence, Social Harms and Human Rights (Springer International Publishing, 2023) 57-76.

[15] Huelss, H., "Deciding on Appropriate Use of Force: Human-machine Interaction in Weapons Systems and Emerging Norms," 10 Global Policy 354-358 (2019).

"1. In the conduct of military operations, constant care shall be taken to spare the civilian population, civilians and civilian objects.

2. With respect to attacks, the following precautions shall be taken:

(a) those who plan or decide upon an attack shall:

(i) do everything feasible to verify that the objectives to be attacked are neither civilians nor civilian objects and are not subject to special protection but are military objectives within the meaning of paragraph 2 of Article 52 and that it is not prohibited by the provisions of this Protocol to attack them;

(ii) take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing, incidental loss of civilian life, injury to civilians and damage to civilian objects;

(iii) refrain from deciding to launch any attack which 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;

(b) 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;

(c) effective advance warning shall be given of attacks which may affect the civilian population, unless circumstances do not permit."[16]

The idea of the Article is clear. It encapsulates the essence of reasonable precaution, emphasizing that constant care in an armed conflict should constantly be taken so that the civilian population and non-combatant population not taking part in hostilities stay away from aggression and harm. Article 57(2) in turn could help grapple with the unpredictability of Learning AWS,[17] usage cases and outcomes, and hence it lists out an exhaustive list of on-site and pre facto actions that the owners or users of AWS must take in order to achieve constant care in their deployment of machine learning technologies. The judicial discussion on the Article also makes this much clear – this article is a definitive guide that requires the combatants to undertake a minimum level of responsibility for their actions and deployment of weaponry

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[16] Article 57(1) and 57(2)(a), (b), and (c), Additional Protocol I, Geneva Convention, 1949.
[17] AKKUŞ, B., "An Assessment of the Acceptance of Meaningful Human Control as a Norm of International Law in Armed Conflicts Using Artificial Intelligence," 81 Ankara Barosu Dergisi 49-101 (2022).

in another state where there are bound to be others present in proximity of the harm. It is also really important to note the emphasis on distinction between civilians and combatants and civilians taking part in the combat here in this Article. Any Ai-enabled, machine learning weapon would need to have the ability to effectively differentiate between these different categories of people and harm (to a reasonable degree, as per the goals of the war at hand) the designated categories of people only.[18] This is a complex feat even for a human operator of weapons and so, for an autonomous weapon, this would be an even more complex task.[19] Through a range of programmes, readings, and real time monitoring of its surroundings, the weapon system would have to take decisions who to strike and who to not strike. Further, it is a sorry state of affair that often in armed conflicts, the civilian populations are targeted by the combatants on the either side to increase pressure on the host country. It has long been used and is presently being used against the people of Gaza, under constant deportation, decapacitation, and violent treatment at the hand of the Israeli combatants. It simply increased the pressure on the official Gaza state to cede the fight. But with these autonomous weapon (and if the international community strongly desires), we have a change to put in factors that will not even consider harming the civilian population in order to have advantageous positions in the war. This could be a great tool to prevent future Gaza-like instances.

Further, the adaptability element common to the machine learning technology could help make sure that there is a more precise and focused application of military force, aimed at where required, and not to the second-hand population of a state under armed conflict. This need is especially felt when the context of Gaza or Ukraine is taken into account, where the armed conflicts are leading to harming and displacement of millions of civilians, despite them having no part in the armed aggressions of the countries against each other. This need for focused aggression aligns with the principles of distinction, proportionality, and necessity under IHL. Article 48 of Additional Protocol I would be a good place to source these principles from. Consider the text of Article 48:

"the Parties to the conflict 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."[20]

It explicitly delineates the core principles necessary in a deployment of ai-technology – the need

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[18] Hua, S-S., "Machine learning weapons and international humanitarian law: Rethinking meaningful human control," (2019) 51 Geo. J. Int'l L. 117.

[19] Tzimas, T., and Tzimas, T., "Legal Ramifications of the Use of AWS's-the Role of IHL and Human Rights," in *Legal and Ethical Challenges of Artificial Intelligence from an International Law Perspective* (2021) 167-198.

[20] Article 48, Additional Protocol I, Geneva Convention, 1949.

for distinction, prohibiting indiscriminate and forceful, blinding attacks and requiring the armed combatants to distinguish between civilian objects and military objectives, helping taking into the entire context of the armed conflict in consideration rather than taking it as an act of mere display of force.[21] The proven fluidity that is present in these constantly learning on the fly machine learning systems could help the weapons adapting to changing armed conflict circumstances, enhancing the adherence to this principle, and ensuring a more targeted and effective application of force necessary for the goals of the war.[22]

Hence, it is clear that when we unpack the prohibitory faction's argument, we find solutions in their very preferences of international law. It shows that we need to depart from a one-size-fits-all strategy for AWS enabled weaponry and instead try for the formulation of specific measures that strike the delicate balance the above part of the research paper talked about. There is however another battle to be fought – the law – it itself, like the AWS subject it seeks to regulate, is unpredictable in its use case and results. Let's explore that before delving into possible solutions for the weaponry in the near future.[23]

IV. UNPREDICTABILITY AND LIABILITY UNDER ICL

The Ai-weapon is unpredictable. And this unpredictability lurking under the surface of all Learning Autonomous Weapons Systems (AWS) poses a profound challenge for the application of the established principles of liability under International Criminal Law (ICL). As stated above, and visible from the quotation of Articles 48 and 57, in traditional armed conflicts, the combatants are held accountable for the reasonably foreseeable consequences of their actions or aggressions. However, the inherently dynamic nature of machine learning does not bow to this principle and instead, introduces a level of unpredictability that complicates the attribution of responsibility, especially in cases that it was decided entirely by the machine in question and in cases that this decision leads unintended harm, especially to the non-combatants in a conflict.[24]

Let's find the liability clause for all armed conflicts. It is Article 85(3) of Additional Protocol I to the Geneva Convention. It reads,

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[21] Pedron, S. M., and Cruz, J. de A., "The future of wars: Artificial intelligence (ai) and lethal autonomous weapon systems (laws)," 2 International Journal of Security Studies 2.1 (2020) 2.

[22] Acquaviva, G., "Crimes without Humanity? Artificial Intelligence, Meaningful Human Control, and International Criminal Law," Journal of International Criminal Justice (2023).

[23] Martino, L., and Merenda, F., "Artificial intelligence: a paradigm shift in international law and politics? Autonomous weapon systems as a case study1," in Technology and International Relations: The New Frontier in Global Power (Edward Elgar Publishing, 2021) 89-108.

[24] Woodcock, T. K., "Human/Machine (-Learning) Interactions, Human Agency and the International Humanitarian Law Proportionality Standard," Global Society (2023) 1-22.

"3. In addition to the grave breaches defined in Article 11, the following acts shall be regarded as grave breaches of this Protocol, when committed willfully, in violation of the relevant provisions of this Protocol, and causing death or serious injury to body or health:

(a) making the civilian population or individual civilians the object of attack;

(b) launching an indiscriminate attack affecting the civilian population or civilian objects in the knowledge that such attack will cause excessive loss of life, injury to civilians or damage to civilian objects, as defined in Article 57, paragraph 2 (a) (iii) ;

(c) launching an attack against works or installations containing dangerous forces in the knowledge that such attack will cause excessive loss of life, injury to civilians or damage to civilian objects, as defined in Article 57, paragraph 2 (a) (iii) ;

(d) making non-defended localities and demilitarized zones the object of attack…"[25]

The core of the Article recognizes that all harm on civilians are serious violations of the laws and customs of armed conflict and war, including those encapsulated in the broader moral and ethical considerations of the international Humanitarian Law (IHL) come together to constitute war crimes. However, how much of it can be attributed to an autonomously learning machine or weapon? How predictable can its results be? Turns out, not much, and hence we resort to some other principles of the IHL and ICL regimes that help put some reasonable responsibility on the AWS systems.[26]

Consider the IHL principles of distinction and proportionality. According to Article 51(1) and (2) and (3) of Additional Protocol I again. They read,

"1. The civilian population and individual civilians shall enjoy general protection against dangers arising from military operations. To give effect to this protection, the following rules, which are additional to other applicable rules of international law, shall be observed in all circumstances.

2. The civilian population as such, as well as individual civilians, shall not be the object of attack. Acts or threats of violence the primary purpose of which is to spread terror among the civilian population are prohibited.

3. Civilians shall enjoy the protection afforded by this Section, unless and for such time as they take a direct part in hostilities."[27]

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[25] Article 85(3), Additional Protocol I, Geneva Convention, 1949.
[26] Schuller, A. L., "At the crossroads of control: The intersection of artificial intelligence in autonomous weapon systems with international humanitarian law," 8 Harv. Nat'l Sec. J. 379 (2017).
[27] Article 51(1), Additional Protocol I, Geneva Convention, 1949.

The Article is one of the stronger worded articles of the convention. It is clear and absolute in its stance – that the civilian population and individual civilians shall not be the object of attack, in any imaginable case. This goal aligns with the broader legal principle of distinction, which requires that the aggressors differentiate between military objectives and civilians, sparing the latter from direct attacks. In cases involving Learning AWSs, this distinctive quality should be programmed and the goals and the objectives of the war should clearly be set in its program, distinct from the secondary harm to the civilian population. This is a complex (but achievable) programming goal that can make it autonomous from the human operator but also bound by the morals and ethics that also bind that human operator. Moreover, other sites in the Convention, like Article 57 (quoted above) also emphasize on the importance of constant care so that the civilians are insulated from the effects of hostilities.[28]

V. PRECAUTIONARY OBLIGATIONS UNDER IHL

So far, the precautionary principles and obligations under IHL (and ICL) seem to be the most promising sites of regulation. Otherwise, there are no clear worded regulations specific to these weapon systems and the other obligations are so broad and unsubstantiated that they do not end up amounting to much of a guiding light for the use cases of these ai-enabled technologies.[29]

It is interesting to note the core of the precautionary obligations under IHL. They are, in effect, trying to balance contradictory fundamental concepts – behavior and war; they seek to guide the conduct of combatants and aggressors during armed conflicts and wars. These principles do so by arguing for a basic structure of human existence, far beyond and bigger than any social or political aggression (that might have led to the war or the conflict). This basic structure of human existence requires the respect of certain dignity principles of all the parties on all sides of the dispute. These may include humanity, distinction, necessity, and proportionality. All these are present in the IHL regime in one way or the other and may in turn inform the future specific treaty rules that might be made for these weapon systems. As already discussed above, for example, the international law principle of distinction prohibits direct attacks against civilians (Article 48 of Additional Protocol I), while the international precautionary obligation requires that the combatants also take constant care to spare the civilian population, civilians and that no harm should come to them even from unintended ways (Article 57 of Additional Protocol I). It is with this dual sided approach erring on the side of caution and absolute liability

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[28] Roumate, F., "Artificial intelligence, ethics and international human rights law," 29 The International Review of Information Ethics (2020).

[29] Goldfarb, A., and Lindsay, J. R., "Prediction and judgment: Why artificial intelligence increases the importance of humans in war," 46.3 International Security 7-50 (2021).

that the precautionary obligations hold the potential for regulating the deployment of Learning AWS.

While these principles are being proclaimed and suggested bright and high, it does remain that their application is not the easiest of all international law applications (as also hinted in the discussion above) and hence, there are rooms for interpretation and concept play in the traditional legal frameworks. However, it becomes a debate again, of what comes first – use or regulation. Because, it is only once that they autonomous systems are deployed that we will be able to gauge their performance and their compliance with the 'human' laws that have been programmed into them.

VI. POSSIBLE SOLUTIONS

The debate of AWS v. IHL stated in the introductory section becomes all about finding a common solution. The challenges and opportunities presented by the learning AWS systems are great and now a solution is required that strikes a balance between the potential benefits and the moral and ethical imperative to ensure compliance with IHL regime.[30]

The first solution is a way to factor in some form of human supervision in the operation of the weapon. This addresses the duty of constant care, a notion crucial to apply IHL to any such armed conflicts. So white traditionally, IHL necessitates constant care to spare civilians from harm in traditional human-to-human armed conflict, it is pertinent to explore the degree of human involvement that is realistically feasible in the operation of machine learning systems. Afterall, strictly sticking to axioms of any kind have been shown (in the above sections) to vastly limit the powers of the technology. There needs to be dynamic programming beyond the simplistic "if X, then Y" rules; there needs to be a space for the device to act on its own because in those minor spaces, come the maximum efficiency gains (for which the entire AI-system is being brought into war in the first place). The system cannot lack the adaptability required in complex and unpredictable conflict scenario and inevitably, there has to some level of scenario-based, on the fly learning so as to adapt to unforeseen situations (that cannot be foreseen or programmed into the weapons). A good way for this is to use the above-stated precautionary principles, say in Article 57(2)(a)(ii) of Additional Protocol I, and feed it into the decision centers of the AWS. Such a statement would require the machine to consider its each move (and attack) and align it with the fact that the conflict under IHL requires parties to take precautions in the choice of methods and means of warfare they deploy to avoid, as much as possible or

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[30] Delic, S., "ARTIFICIAL INTELLIGENCE: HOW AI IS UNDERSTOOD IN THE LIGHT OF DEMOCRACY AND HUMAN RIGHTS" (2019).

incidental loss of civilian life not engaging in the combat.[31]

While this is there, there would also be a need for continuous monitoring and ethical oversight over the machine, at least in the current initial stages of its development. The machine is new and has not gained absolute trust in being a reliable arbiter of moral and ethical imperatives of the law and hence there needs to be constant monitoring over the technology even if it is autonomously being deployed. This aligns with the duty of constant care present in the above stated articles, emphasizing the ongoing responsibility of the combatants (and hence, by extension, their new tools of warfare) to spare civilians from harm. Article 36 of Additional Protocol I reads:

"In the study, development, acquisition or adoption of a new weapon, 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."[32]

Article 36 is there to ensure that any new weapons (like the present AI-tech fueled AWS) that the combatants develop or acquire are assessed to determine their strict compliance with IHL. This is a great place to argue for constant monitoring and ethical assessments of the AWS weaponry to evaluate their adherence to IHL principles and if they are complying by the principles of law like human beings do or not.

Finally, there needs to an international cooperation over this technology. Though they must not, wars and aggressions are bound to happen, especially considering the sensitive geopolitical balance in the world right now in light of Gaza and Ukraine. Hence, it is better to cooperate over these weapon systems rather than facing the brunt of their unbridled usage. In that light it is necessary that we recognize the transboundary nature of armed conflicts. There is a need for international cooperation and standardization of use case principles and expected results to ensure the responsible deployment of machine learning weapons from either or all sides of the conflict, by all combatants. This approach would make sure we adhere to the common theme of all IHL principles that seek the universality of humanitarian norms, even in diverse and distressed conditions of conflict.[33]

VII. CONCLUSION

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[31] Klonowska, K., "Article 36: Review of AI Decision-Support Systems and Other Emerging Technologies of Warfare," in Yearbook of International Humanitarian Law, Volume 23 (2020) 123-153.

[32] Article 36, Additional Protocol I, Geneva Convention, 1949.

[33] Law, U. Q., "Legal Review of AWS: Decision support systems and technical feasibility of review," Eye (2023).

In conclusion, the intricate landscape of Learning Autonomous Weapon Systems (AWSs) requires the present regulators and law makers and states in the international community to adopted a nuanced and comprehensive approach. This approach would require that the people considering the deployment of ai-tech neither outrightly prohibit nor unconditionally embrace the deployment in armed conflict and wars. As illuminated in this research paper, formulating viable solutions requires that we engage in a meticulous examination of a myriad of factors that range cross our historical, political, moral, ethical, and practical dimensions. This evaluative process in turn depends upon the various indices inherent in armed conflicts, like, the degree of human supervision over autonomous weapons, the complexity and limits of dynamic programming that enables adaptive decision-making in complex scenarios, continuous monitoring initiatives, and ethical oversight frameworks by the combatants over their respective technologies during their active deployment in war time or armed conflict. And finally, the key thing required is international cooperation and the willingness among states to even care for these moral and ethical considerations of using the ai-enabled weapon systems.[34]

To answer the research questions raised at the beginning of this paper, yes, there are a host of potential benefits (especially civilian safety) of the AWS systems that overpower the harms and threats these systems bring and there are pockets within the International Humanitarian Law to be found in the precautionary principles and constant care principles that can be used to meaningfully regulate new age ai-enabled, autonomous learning weapons in situations of wars and armed conflicts. The approach to either of these – AWS or IHL – should be reserved approach as discussed in the paper.

The proposed solutions in this research paper weave together the complex interplay of these above stated factors with various relevant articles and clauses of International Humanitarian Law (IHL), with a particular focus on International Criminal Law (ICL). By doing so, this research paper seeks to lay the groundwork for a balanced and judicious importation of machine learning technology into the context of wars and armed conflicts. At the same time, the research paper has recognized that the significance of aligning this importation of technology and the proposed solutions thereof need to alight with the core, basis to humans, legal frameworks.[35] The essence of the suggestions of this paper is not only to have the potential advantages of machine learning within war and armed conflict scenarios (especially the ones that seek to reduce harm to the civilian populations) but also to prioritize and uphold the moral, humane,

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[34] Bode, I., and Huelss, H., "The Future of Remote Warfare? Artificial Intelligence, Weapons Systems and Human Control," in Remote Warfare (2021) 218.
[35] Nair, S., "Rise of the Robots: Weaponization of Artificial Intelligence," 23 maritime (2023).

and ethical imperatives of that bind a human combatant, especially in the sensitive context of war and human conflict. The research paper sought to strike a delicate balance between efficiency gains and the fundamental principles of human dignity and ethical conduct in times of war. The emphasis here is on fostering an environment where the deployment of AWSs is not divorced from human oversight and where international cooperation becomes a cornerstone for mitigating the ethical challenges associated with the integration of machine learning in armed conflicts.

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