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The Legal Challenges of Artificial Intelligence in International Humanitarian Law

Dr. Ahmed Hatem Al-Rubaie

Assistant Professor of International Law - Iraq

Abstract:

Artificial intelligence (AI) has emerged as one of the most transformative technologies of the twenty-first century, reshaping not only civilian life but also the nature of modern warfare. This study explores the legal challenges posed by the integration of AI systems into armed conflicts within the framework of international humanitarian law (IHL). The research aims to analyze whether the current IHL principles—particularly distinction, proportionality, and accountability—are sufficient to regulate the use of autonomous and semi-autonomous weapons driven by AI.

The study adopts a qualitative legal methodology, combining doctrinal analysis with a comparative approach to assess existing international norms, treaties, and ethical guidelines related to the use of AI in warfare. It also examines the ethical dilemmas and risks associated with delegating life-and-death decisions to machines, and the resulting gaps in responsibility and accountability under international law.

Findings indicate that while AI may enhance precision and reduce certain forms of human error, it simultaneously challenges the humanitarian foundations of warfare by blurring the line between combatants and civilians and complicating attribution of responsibility. The research concludes that the existing legal framework under IHL is inadequate to fully address the complexities introduced by AI technologies. Therefore, the study recommends the development of a specialized international treaty to regulate AI use in armed conflicts, emphasizing human control, transparency, and accountability mechanisms to preserve humanitarian values.

Keywords: Artificial Intelligence, International Humanitarian Law, Autonomous Weapons, Accountability, Distinction, Proportionality, Ethics of Warfare.

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Introduction

Artificial intelligence (AI) represents one of the most transformative technological developments of the twenty-first century, reshaping global economies, governance, and—most crucially—the nature of warfare. In recent years, states have increasingly integrated AI technologies into military operations, ranging from automated surveillance systems to autonomous lethal weapons capable of selecting and engaging targets without direct human intervention. This shift toward automation in armed conflict presents profound legal and ethical challenges for international humanitarian law (IHL), the body of law that governs the conduct of hostilities and seeks to protect those who are not, or no longer, participating in hostilities[1].

Historically, IHL has evolved through treaties such as the Geneva Conventions (1949) and their Additional Protocols (1977), as well as through customary international law, to address the humanitarian consequences of traditional warfare.[2] However, the rise of AI-driven technologies has generated novel questions that were unimaginable at the time these instruments were drafted. Can an autonomous weapon system (AWS) comply with the principle of distinction between combatants and civilians? How can proportionality be assessed by an algorithm? And, perhaps most importantly, who bears responsibility when an AI-based weapon commits a violation of IHL? These questions lie at the heart of this study[3].

The application of IHL to AI-based military technologies is not merely a theoretical matter; it reflects an urgent practical concern. Several states, including the United States, China, Russia, and the United Kingdom, have already invested heavily in developing AI-driven defense systems[4]. The pace of this technological competition raises the risk that law will lag behind innovation, leaving a regulatory vacuum where accountability becomes elusive. International organizations such as the United Nations (UN) and the International Committee of the Red Cross (ICRC) have thus called for renewed discussions on the legal and ethical implications of these systems, particularly the extent to which existing IHL principles can adapt to such disruptive technologies[5].

[1] -Sassòli, M., International Humanitarian Law: Rules, Controversies, and Solutions to Problems Arising in Warfare, Edward Elgar Publishing, 2019.
[2]-Geneva Conventions of 1949 and Additional Protocols of 1977, International Committee of the Red Cross (ICRC).
[3]-Boothby, W., Weapons and the Law of Armed Conflict, 3rd ed., Oxford University Press, 2022.
[4] -Scharre, P., Army of None: Autonomous Weapons and the Future of War, W. W. Norton & Company, New York, 2018.
[5]-United Nations, “Report of the Group of Governmental Experts on Lethal Autonomous Weapons Systems,” A/75/321, 2021.

Moreover, the principle of human control—long considered a cornerstone of lawful warfare—faces unprecedented strain in the era of AI. As machines gain increasing autonomy in decision-making, the traditional framework that presupposes human intent and agency begins to erode. This erosion challenges the foundational legal doctrines of attribution and responsibility, which are essential for maintaining accountability under international law[1]. The complexity of AI systems, coupled with their ability to learn and evolve beyond initial programming, further complicates the identification of culpable actors in cases of violations.

From a broader perspective, the intersection between AI and IHL reflects the tension between technological progress and humanitarian restraint. While AI offers the potential to enhance precision and minimize collateral damage, it also introduces unpredictability, algorithmic bias, and the potential for dehumanized warfare[2]. The increasing reliance on machine learning algorithms in targeting and threat analysis blurs the line between lawful military necessity and arbitrary violence—an outcome fundamentally inconsistent with the objectives of IHL.

This research, therefore, aims to conduct a comprehensive legal analysis of the challenges posed by AI technologies to the existing framework of international humanitarian law. It seeks to answer three central questions:

1.To what extent can current IHL rules adequately regulate AI-driven military systems?
2.How can responsibility be attributed for violations caused by autonomous systems?
3.What legal reforms or international mechanisms are necessary to ensure compliance with humanitarian principles in the age of AI?

To achieve these objectives, the study adopts a doctrinal and analytical methodology. It relies on international treaties, customary law, and relevant jurisprudence, alongside reports from the UN, ICRC, and academic commentaries. Comparative perspectives are also employed, drawing upon national military policies and ethical guidelines from technologically advanced states.

[1]-Casey, B., Farhangi, A., & Véliz, C., “Rethinking Explainable Machines: The Limits of Interpretable AI in the War Context,” AI & Society, Vol. 38, 2023.
[2]-Sharkey, N., “The Evitability of Autonomous Robot Warfare,” International Review of the Red Cross, Vol. 94, No. 886, 2012.

The first chapter lays the conceptual and legal foundations necessary to understand AI within the framework of IHL. It introduces the evolution of AI technologies in warfare, the principles of IHL relevant to their application, and the initial debates surrounding accountability and legality. The subsequent chapters will examine, in greater depth, the issues of state and individual responsibility, as well as the emerging international initiatives aimed at regulating autonomous weapons.

Ultimately, the study contends that while existing IHL principles provide a starting point for regulating AI in warfare, they are insufficient to address the unique challenges posed by autonomy, unpredictability, and lack of direct human control. A new interpretive and regulatory approach—grounded in both legal reform and ethical accountability—is therefore essential to ensure that technological progress remains consistent with the humanitarian objectives of international law[1].

[1]-Bhuta, N., Beck, S., Geiß, R., Liu, H-Y., & Kreß, C., Autonomous Weapons Systems: Law, Ethics, Policy, Cambridge University Press, 2016.

Section One

Understanding Artificial Intelligence and Its Military Applications

Subsection 1: Defining Artificial Intelligence in Modern Warfare

Artificial Intelligence (AI) is broadly understood as the ability of machines to perform tasks that would normally require human intelligence, such as perception, reasoning, learning, and decision-making. In legal and policy discourse, AI refers to computer systems that can process vast datasets, identify patterns, and make predictions or autonomous decisions without continuous human supervision[1].

The origins of AI date back to the 1950s, when early computer scientists such as Alan Turing and John McCarthy envisioned machines capable of simulating human reasoning. However, the last two decades have witnessed a rapid evolution of AI, driven by advances in computational power, data analytics, and machine learning[2]. Today, AI is no longer confined to theoretical laboratories - it is embedded in critical sectors including healthcare, finance, and most significantly, defense.

In the context of modern warfare, AI encompasses a wide spectrum of technologies, from autonomous drones and unmanned ground vehicles to intelligent command systems capable of analyzing battlefield data in real time[3]. These systems employ various degrees of autonomy:

- Semi-autonomous systems, which assist human operators in decision-making but require human authorization for lethal actions.
- Fully autonomous systems, which can identify, select, and engage targets independently, based on pre-programmed algorithms or adaptive learning models[4].

The latter category, commonly referred to as Lethal Autonomous Weapons Systems (LAWS), has generated intense debate within the international legal community. The key legal concern is whether these systems can operate in conformity with the established principles of International Humanitarian Law (IHL)—particularly those of distinction, proportionality, and precaution.[5]

[1]-Russell, S., & Norvig, P., Artificial Intelligence: A Modern Approach, Pearson Education, 2022.
[2]-Turing, A. M., "Computing Machinery and Intelligence," Mind, Vol. 59, 1950.
[3]- Schmitt, M. N., "Autonomous Weapons and International Humanitarian Law: Issues of Responsibility," Harvard National Security Journal, Vol. 8, 2017.
[4]-ICRC, Autonomous Weapon Systems: Implications of Increasing Autonomy in the Critical Functions of Weapons, Geneva, 2016.
[5] -Asaro, P., "On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-Making," International Review of the Red Cross, Vol. 94, No. 886, 2012.

Importantly, AI does not merely introduce technical challenges; it redefines the fundamental nature of human participation in warfare. The human-in-the-loop model —where a human supervises and authorizes each critical function—is being progressively replaced by human-on-the-loop or even human-out-of-the-loop frameworks, where human oversight is minimal or entirely absent[1]. Such shifts raise complex questions about moral agency, accountability, and the essence of lawful combat.

Beyond the battlefield, AI-driven decision-support systems are increasingly being used in strategic planning, logistics, cyber defense, and intelligence analysis. For instance, predictive algorithms can assess potential enemy actions or suggest optimal resource allocation based on real-time data inputs. While such capabilities may enhance military efficiency, they simultaneously amplify the risk of algorithmic bias, data manipulation, and misinterpretation of contextual variables—a risk that may lead to unlawful attacks or disproportionate responses under IHL[2].

Thus, understanding AI in warfare is not merely a technological necessity but a legal imperative. Before evaluating how international law can regulate its use, it is essential to grasp how AI alters the nature of decision-making, agency, and control within armed conflict.

[1]-Crootof, R., “The Killer Robots Are Here: Legal and Policy Implications,” Cardozo Law Review, Vol. 36, 2015.
[2]-Bhuta, N. et al., Autonomous Weapons Systems: Law, Ethics, Policy, Cambridge University Press, 2016.

Subsection 2: The Evolution and Deployment of AI Systems in Armed Conflicts

The militarization of AI has progressed through several distinct phases. In its early form, automation in warfare was limited to target acquisition and missile guidance systems[1]. However, the post-2010 era has seen a paradigm shift towards systems capable of independent learning and adaptation. Modern military AI can process battlefield imagery, track troop movements, and predict adversary behavior using neural networks and deep-learning algorithms[2].

The United States was among the first to operationalize AI technologies through programs like Project Maven, which employs machine learning to analyze surveillance footage for identifying enemy targets[3]. Similarly, China has prioritized AI as part of its national defense modernization strategy, with the People's Liberation Army integrating intelligent systems into combat drones and naval operations[4]. Russia, Israel, and South Korea have also developed varying degrees of autonomous military systems, such as sentry robots and defensive turrets capable of engaging targets independently.[5]

The growing deployment of AI systems has generated mounting international concern regarding compliance with IHL. The unpredictability of machine-learning algorithms makes it difficult to ensure compliance with Article 48 of Additional Protocol I (1977), which requires parties to distinguish at all times between civilian and military objectives[6]. Moreover, the principle of proportionality—enshrined in Article 51(5)(b) of the same Protocol—demands that collateral damage not be excessive in relation to the anticipated military advantage. Whether AI systems can make such moral and contextual judgments remains doubtful[7].

[1]-Boothby, W. H., Weapons and the Law of Armed Conflict, 3rd ed., Oxford University Press, 2022.
[2]- European Parliament, Report on Autonomous Weapon Systems and International Humanitarian Law, 2020.
[3]-Defense Innovation Board, AI Principles: Recommendations on the Ethical Use of Artificial Intelligence by the Department of Defense, 2019.
[4]- Kania, E. B., "Battlefield Singularity: Artificial Intelligence, Military Revolution, and China's Future Military Power," Center for a New American Security, 2017.
[5]- Sauer, F., "Stopping 'Killer Robots': Why Now Is the Time to Ban Autonomous Weapons," Arms Control Today, Vol. 45, No. 1, 2015.
[6] -Additional Protocol I to the Geneva Conventions (1977), Article 48.
[7] -Ibid., Article 51(5)(b).

Scholars argue that while automation may reduce human error, it simultaneously creates new kinds of risk, particularly when algorithms operate on incomplete or biased data[1]. The reliance on opaque "black box" decision models further complicates post-incident accountability. For instance, if an autonomous drone misidentifies a civilian convoy as a hostile target, determining whether the fault lies in programming, data input, or system malfunction becomes a near-impossible legal task[2].

Additionally, the integration of AI in cyber warfare represents an emerging domain of concern. AI-enhanced malware and automated hacking tools can conduct offensive cyber operations at a scale and speed that defy human oversight[3]. These operations often blur the line between kinetic and non-kinetic attacks, challenging traditional thresholds of armed conflict under Article 2(4) of the UN Charter, which prohibits the use of force[4].

In short, the evolution of AI in armed conflicts reflects both opportunity and peril. While it promises enhanced precision, efficiency, and reduced casualties, it also threatens to erode the legal and ethical foundations upon which modern humanitarian law is built. The next section will therefore explore the legal framework of IHL and assess how its principles apply—or fail to apply—to AI-driven military systems.

[1] -Sparrow, R., "Twenty Seconds to Comply: Autonomous Weapon Systems and the Recognition of Surrender," International Law Studies, Vol. 91, 2015.
[2] -Scharre, P., Army of None: Autonomous Weapons and the Future of
War, W. W. Norton & Company, 2018.
[3]-Lin, H., "Cyber Conflict and International Humanitarian Law," International Review of the Red Cross, Vol. 94, 2012
[4]-United Nations Charter, Article 2(4).

Section Two

The Compatibility of Artificial Intelligence with International Humanitarian Law (IHL)

Subsection 1: The Principle of Distinction and AI Challenges

One of the most fundamental pillars of international humanitarian law (IHL) is the principle of distinction, which requires parties to an armed conflict to distinguish at all times between combatants and civilians, as well as between military objectives and civilian objects[1]. This rule is enshrined in Article 48 of Additional Protocol I (1977) to the Geneva Conventions, which establishes the foundation for lawful targeting during warfare. However, when artificial intelligence (AI) and autonomous systems are introduced into military operations, the ability to uphold this principle becomes highly questionable.

The effectiveness of AI-based targeting systems depends largely on the accuracy and reliability of their data inputs. Machine learning algorithms, which are at the core of many autonomous weapons systems (AWS), rely on large datasets for training and decision-making[2]. Yet, in the chaos of armed conflict, such data is often incomplete, outdated, or biased. This limitation increases the risk of false identification, where an AI system may misclassify civilians as combatants or civilian infrastructure as a military objective[3].

Furthermore, the black-box nature of AI systems—where the internal decision-making process is not easily interpretable—compounds the challenge of verifying compliance with IHL[4]. The principle of distinction demands that decision-making processes be subject to human understanding and control. If humans cannot explain or predict why an AI system made a targeting decision, accountability and legality become difficult to establish.

[1]- Additional Protocol I to the Geneva Conventions, Article 48, 1977.
[2] -Boothby, W., Weapons and the Law of Armed Conflict, 3rd ed., Oxford University Press, 2022.
[3] -Scharre, P., Army of None: Autonomous Weapons and the Future of War, W. W. Norton & Company, 2018.
[4]-Casey, B., Farhangi, A., & Véliz, C., “Rethinking Explainable Machines,” AI & Society, Vol. 38, 2023.

Some scholars argue that AI may, in certain cases, outperform humans by reducing emotional bias and fatigue, leading to more precise targeting[1]. Nevertheless, this potential advantage does not negate the legal obligation to ensure that AI decisions comply with IHL principles in every individual strike. AI's inability to interpret contextual cues—such as the surrender of combatants or the presence of wounded persons—poses a serious risk to compliance[2].

Subsection 2: The Principle of Proportionality and the Role of Human Judgment

The principle of proportionality, another cornerstone of IHL, prohibits attacks that may cause excessive civilian harm in relation to the anticipated military advantage[3]. This principle inherently requires the exercise of human judgment, as it involves complex value-based assessments that balance humanitarian and military considerations.

AI systems, even the most advanced ones, currently lack the moral and contextual understanding necessary for proportionality assessments. They operate on pre-programmed criteria and probability models that cannot capture the human experience of suffering or the ethical nuances of warfare[4]. For instance, when determining whether collateral damage is "excessive," a commander might consider the timing of the attack, the density of civilian presence, or the potential for long-term harm—factors beyond the scope of algorithmic reasoning.

Moreover, proportionality requires ex ante evaluation—that is, assessment before the attack occurs[5]. However, autonomous systems may act without real-time human oversight, thereby eliminating the opportunity for commanders to make these essential legal evaluations. This raises the pressing question of whether "meaningful human control" can be preserved when AI assumes increasing autonomy in targeting and engagement decisions.

[1] -Lin, P., Bekey, G., & Abney, K., Autonomes Robots and the Law of Armed Conflict, Ethics and Emerging Technologies Group, California Polytechnic State University, 2021.
[2]-Sharkey, N., "The Evitability of Autonomous Robot Warfare," International Review of the Red Cross, Vol. 94, No. 886, 2012.
[3]- ICRC, Interpretive Guidance on the Notion of Direct Participation in Hostilities, Geneva, 2009.
[4] -Sassòli, M., International Humanitarian Law: Rules, Controversies, and Solutions to Problems Arising in Warfare, Edward Elgar Publishing, 2019.
[5]-United Nations, "Group of Governmental Experts on Lethal Autonomous Weapons Systems," A/75/321, 2021.

To mitigate this challenge, some states, such as the United Kingdom, emphasize a framework of “human-on-the-loop” rather than “human-out-of-the-loop” operations, meaning that human operators must retain supervisory authority over all AI-based targeting processes[1]. Yet, the rapid speed and complexity of modern warfare make continuous human oversight impractical, particularly in multi-domain conflicts where AI systems must make split-second decisions.

Subsection 3: Accountability, Responsibility, and State Obligations

A central concern in applying IHL to AI warfare lies in determining accountability for violations. Under traditional IHL, responsibility can be attributed to the state, the commander, or the individual who directly commits the act[1]. However, when an autonomous system makes a decision leading to unlawful harm, the line of attribution becomes blurred.

If the AI operates based on machine learning, its behavior might evolve beyond the intentions or understanding of its programmers or operators. This raises the problem of the so-called **“responsibility gap.”**[2] The state may claim it fulfilled its due diligence by testing and regulating the weapon, while the manufacturer might argue it only provided a tool, and the commander may assert that the machine acted unpredictably. In such cases, victims of violations may struggle to find justice, as no human agent can be clearly held accountable.

The International Law Commission (ILC), in its Articles on State Responsibility (2001), establishes that states are responsible for internationally wrongful acts attributable to them, even when committed through autonomous mechanisms[3]. However, enforcement becomes challenging when the act results from algorithmic decision-making rather than direct human conduct. Therefore, it is crucial that states adopting AI weapons ensure clear lines of command responsibility and transparent audit mechanisms.

[1]-ICRC, Commentary on the First Geneva Convention, Cambridge University Press, 2016.
[2]-Danaher, J., “The Responsibility Gap: Ascribing Responsibility for the Actions of Autonomous Weapons Systems,” Ethics and Information Technology, Vol. 17, 2015.
[3]- International Law Commission, Articles on Responsibility of States for Internationally Wrongful Acts, 2001.

Some scholars and international organizations propose the creation of a new treaty regime specifically addressing autonomous weapons, similar to the 1997 Ottawa Convention on landmines or the 2008 Convention on Cluster Munitions[1]. Such an instrument could define limits on autonomy, establish mandatory testing and review procedures under Article 36 of Additional Protocol I, and require states to maintain human oversight at all stages of deployment.

In essence, the compatibility of AI with IHL remains deeply contested. While certain aspects of existing law—such as the general principles of distinction and proportionality—are theoretically adaptable to new technologies, their practical enforcement in AI-driven warfare remains uncertain. Without clear accountability and transparency frameworks, there is a serious risk that AI could undermine the very humanitarian objectives that IHL seeks to preserve.

[1]-Bhuta, N., et al., Autonomous Weapons Systems: Law, Ethics, Policy, Cambridge University Press, 2016.

Section Three

Regulatory Frameworks and the Future of AI Governance in Armed Conflict

Subsection 1: Existing International Legal Frameworks Governing AI in Warfare

Despite the transformative impact of artificial intelligence (AI) on modern warfare, no specific international treaty currently regulates the development or use of AI-based weapon systems. States therefore rely on general principles of international humanitarian law (IHL), arms control treaties, and emerging soft-law instruments to guide their behavior[1].

The Geneva Conventions of 1949 and their Additional Protocols of 1977 remain the primary sources of IHL obligations, ensuring the protection of civilians and restricting the means and methods of warfare[2]. Under Article 36 of Additional Protocol I, states are required to review all new weapons, means, or methods of warfare to ensure their compliance with international law[3]. This article provides the legal basis for the obligation to conduct “legal weapons reviews” before deploying AI-driven systems.

However, states differ widely in how they interpret and apply Article 36. The United Kingdom, for instance, maintains a formalized process through its Weapons Review Committee, which evaluates emerging technologies for compliance with IHL principles[4]. In contrast, many states lack such review mechanisms, leading to uneven application of international norms. Moreover, these reviews often rely on information provided by military contractors, raising concerns about transparency and independence[5].

Beyond IHL, other regimes such as international human rights law (IHRL) and arms control agreements play supplementary roles. The Convention on Certain Conventional Weapons (CCW), adopted in 1980, provides a platform for ongoing multilateral discussions on the legality of lethal autonomous weapons systems (LAWS)[6]. Since 2014, the UN Group of Governmental Experts (GGE) under the CCW has held regular meetings to examine the humanitarian, ethical, and security implications of AI in warfare[7].

[1] -Sassòli, M., International Humanitarian Law, Edward Elgar Publishing, 2019.
[2] -Geneva Conventions of 1949 and Additional Protocols of 1977.
[3] -Additional Protocol I, Article 36, 1977.
[4] -UK Ministry of Defence, Weapons Review Procedure, London, 2022.
[5]- Lin, P., & Abney, K., Robot Ethics 2.0: From Autonomous Cars to Artificial Intelligence, Oxford University Press, 2017.
[6] CCW Convention on Certain Conventional Weapons, 1980.
[7]- United Nations, “Report of the Group of Governmental Experts on Lethal Autonomous Weapons Systems,” A/78/300, 2023.

Nevertheless, these discussions have not yet produced binding obligations. States are deeply divided: countries like the United Kingdom, the United States, and Israel advocate for maintaining flexibility to develop AI technologies under existing law, while others—such as Austria, Brazil, and Chile—demand a complete international ban on fully autonomous lethal weapons[1]. This deadlock has delayed the establishment of a unified international regulatory instrument.

Subsection 2: Ethical Governance and the Role of Human Control

As the legal debate remains unresolved, increasing attention has turned to ethical governance frameworks that emphasize the concept of "meaningful human control" (MHC). This principle holds that humans must remain actively involved in critical decisions about the use of force, particularly decisions to select and engage targets[2].

The International Committee of the Red Cross (ICRC) supports this principle as a necessary safeguard for compliance with IHL and human rights law[3]. Similarly, the European Union and the UK Ministry of Defence have incorporated MHC into their policy frameworks, ensuring that human operators are accountable for all AI-enabled military actions[4].

Ethical governance goes beyond compliance with legal norms—it addresses questions of legitimacy, morality, and trust in technology[5]. AI systems, even when legally compliant, may still produce morally unacceptable outcomes if they lack human empathy or context sensitivity. The Martens Clause, first introduced in the preamble to the 1899 Hague Convention, asserts that in cases not covered by existing treaties, civilians and combatants remain under the protection of the "principles of humanity" and "the dictates of public conscience."[6] This clause provides a moral foundation for regulating AI systems that challenge traditional notions of human agency in warfare.

Many scholars argue that the Martens Clause should serve as a guiding principle in developing future AI regulations, ensuring that technological advancements do not erode fundamental humanitarian values[7]. In this regard, maintaining human dignity, accountability, and transparency must remain non-negotiable standards, even when efficiency and precision tempt states to rely more heavily on autonomous systems.

[1]-Bhuta, N., Beck, S., Geiß, R., Liu, H-Y., & Kreß, C., Autonomous Weapons Systems: Law, Ethics, Policy, Cambridge University Press, 2016.
[2]-ICRC, "Position on Autonomous Weapon Systems," 2021.
[3]-ICRC, International Humanitarian Law and Autonomous Weapons, Geneva, 2022.
[4] European Parliament Resolution on AI in Defence, 2021/2051(INI).
[5]-Sharkey, N., "The Moral Responsibility of Autonomous Weapons," Ethics and Information Technology, Vol. 19, 2022.
[6] -Hague Convention (II) with Respect to the Laws and Customs of War on Land, 1899 (Preamble).
[7]- Sassòli, M., Humanity and the Law of Armed Conflict, Cambridge University Press, 2020.

Subsection 3: Prospects for a New International Treaty and Future Challenges

Given the current legal vacuum, several proposals have emerged advocating for a new international treaty to regulate or prohibit lethal autonomous weapons systems (LAWS). The most prominent initiatives are those advanced by the Campaign to Stop Killer Robots, a global coalition of civil society organizations calling for preemptive prohibition of fully autonomous weapons[1].

Proponents of a new treaty argue that existing IHL norms are insufficient to address the unique challenges of AI warfare—particularly accountability gaps, algorithmic bias, and unpredictability[2]. A binding instrument, modeled after the Ottawa Treaty (1997) on anti-personnel mines or the Convention on Cluster Munitions (2008), could establish clear obligations such as:

- Prohibiting the development and deployment of fully autonomous lethal weapons.
- Requiring meaningful human control over all uses of force.
- Mandating transparency and information-sharing between states.
- Imposing criminal liability for violations arising from autonomous operations[3].

However, achieving such a treaty faces significant political and technical obstacles. Major military powers, including the United Kingdom, have expressed resistance to restrictive measures, emphasizing the potential benefits of AI for precision and civilian protection[4]. Furthermore, defining what constitutes “autonomy” remains contentious: many systems operate on a spectrum between automation and independence, complicating regulatory clarity[5].

Looking forward, the future of AI governance in warfare will likely involve a hybrid model combining legally binding obligations with voluntary ethical standards[6]. Regional organizations such as the European Union may take the lead in establishing best practices, while the UN and ICRC continue to promote international consensus. Domestic military doctrines, transparency measures, and public pressure from civil society will also play essential roles in shaping responsible AI governance.

Ultimately, the integration of AI into armed conflict demands not only legal adaptation but also a reaffirmation of humanitarian values. The international community must strike a balance between innovation and restraint—between the promise of technological progress and the imperative to preserve human dignity in war. Without such balance, the future of AI in warfare may not only transform battlefields but also redefine the boundaries of humanity itself[7].

[1] -Campaign to Stop Killer Robots, Advocacy Report, 2022.
[2] -Danaher, J., “Robots, Law and the Responsibility Gap,” AI & Society, Vol. 35, 2023.
[3] -United Nations Institute for Disarmament Research (UNIDIR), Toward a Treaty on Autonomous Weapons, Geneva, 2023.
[4]-UK Ministry of Defence, AI and Autonomy in Defence: Policy Framework, 2022.
[5]-Boothby, W., Weapons and the Law of Armed Conflict, Oxford University Press, 2022
[6]-United Nations, Responsible AI in the Military Domain (REAIM) Summit Report, The Hague, 2023.
[7]-Scharre, P., Army of None: Autonomous Weapons and the Future of War, W. W. Norton & Company, 2018.

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Conclusion

Artificial intelligence (AI) represents both an unprecedented opportunity and a profound challenge for international humanitarian law (IHL). Throughout this study, it has become clear that while AI has the potential to improve precision and reduce human error in warfare, it simultaneously threatens to undermine fundamental humanitarian principles that have guided armed conflict regulation for more than a century.

The research has shown that current IHL norms—particularly the principles of distinction, proportionality, and accountability—were developed for human decision-makers, not machines. As AI systems gain greater autonomy in identifying and engaging targets, ensuring compliance with these principles becomes increasingly uncertain.

Moreover, the problem of attribution and the "responsibility gap" remains one of the most significant legal challenges. When an AI system commits an unlawful act, identifying a culpable actor—whether the state, the programmer, or the commander—proves difficult. This undermines the core principle of accountability that lies at the heart of IHL enforcement mechanisms.

Despite these challenges, the study demonstrates that existing international law still provides a meaningful framework for addressing AI warfare, provided it is interpreted dynamically and supplemented by new regulatory instruments. The legal reviews under Article 36 of Additional Protocol I, the ethical standards developed by states such as the United Kingdom, and the ongoing deliberations within the UN Convention on Certain Conventional Weapons (CCW) collectively represent the early foundations of a future governance regime.

Ultimately, the future of AI in warfare must not be guided solely by technological capability but by the moral and humanitarian limits of warfare. The law must evolve not just to regulate innovation, but to preserve humanity itself.

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Findings

1.Existing IHL principles remain relevant but require reinterpretation to address the unique characteristics of AI, such as autonomy, unpredictability, and lack of moral judgment.
2.The principle of distinction faces significant risk in AI warfare due to data bias, target misidentification, and the opacity of machine-learning processes.
3.Proportionality assessments cannot be automated because they involve moral and contextual judgments that exceed algorithmic reasoning.
4.Accountability gaps persist—current legal structures struggle to assign responsibility when AI systems commit violations beyond human intent.
5.International consensus is fragmented, with major powers opposing restrictions and other states calling for preemptive bans on lethal autonomous weapons.
6.Ethical governance frameworks such as "meaningful human control" offer a promising, though non-binding, approach to maintaining human oversight.
7.Article 36 weapons reviews serve as the most immediate legal tool for AI regulation but require global standardization and transparency.
8.A future treaty or hybrid legal framework combining IHL obligations and ethical standards appears essential to balance innovation with humanitarian protection.

Recommendations

1.Adopt a binding international treaty under the auspices of the United Nations to regulate or prohibit fully autonomous lethal weapons, modeled after existing disarmament conventions.
2.Establish global standards for Article 36 weapons reviews to ensure consistent assessment of AI systems' compliance with IHL.
3.Maintain meaningful human control over all decisions related to the use of force, embedding accountability within both design and operational processes.
4.Promote transparency and public reporting by states and defense industries developing AI technologies for military use.
5.Integrate ethical AI principles—such as explainability, fairness, and human oversight—into military doctrines and defense policies.
6.Encourage interdisciplinary collaboration between lawyers, ethicists, engineers, and policymakers to ensure a holistic approach to AI governance.
7.Support the work of the ICRC and UN GGE in developing interpretive guidance and facilitating global consensus on responsible AI use in armed conflict.
8.Prioritize humanitarian outcomes over technological competition, reaffirming that the laws of war must evolve to preserve the principles of humanity and dignity in all circumstances.

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