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The Use of Artificial Intelligence in Armed Conflict under International Law

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Abstract: Artificial Intelligence (AI) is a technological achievement that simulates human intelligence through machines or computer programs. The integration of AI in military operations aims to minimize combatant casualties and enhance effectiveness in warfare. Despite the advantages and significance of this research, concerns arise regarding the ideal implementation of AI in armed conflicts due to potential security challenges. A significant issue lies in the legal perspective governing AI as a comprehensive defense tool. This paper employs a juridical normative research method based on a statutory approach to provide a descriptive analysis and examine the regulatory framework surrounding AI in armed conflict. The results indicate that the absence of comprehensive regulations complicates the accountability framework, making liability determination intricate, particularly when AI malfunctions due to substandard quality or improper use. In such cases, accountability may extend to both the creator and the user. The concept of liability for violations in armed conflict is explored according to international law, highlighting the implications and associated responsibilities of using AI within legal principles. This paper concludes that AI regulation must be crafted to ensure usage aligns with established procedures within the framework of international law.

Keywords: Artificial Intelligence; Armed Conflict; Drone; International Law; Military Operations; Security

1. Introduction

Artificial Intelligence (AI) is the scientific and engineering discipline dedicated to crafting intelligent machines, primarily achieved through the use of computer programs. AI includes the emulation of human intelligence within machine processes and is focused on conceiving, constructing, and deploying computer systems.[1] AI has been developing since 1956, but interest surged around 2010 due to three key factors: the rise of big data, advancements in machine learning, and increased computing power.[2]

The swift advancement of artificial intelligence has positively impacted various fields like medicine and transportation. However, its military applications spark significant debate.

[1] Haenlein, Michael, and Andreas Kaplan. "A brief history of artificial intelligence: On the past, present, and future of artificial intelligence." *California Management Review* 61, no. 4 (2019): 5-14.

[2] Sayler, Kelley M. "Artificial intelligence and national security." *Congressional Research Service* 45178 (2020): 2

It is now widely acknowledged that AI will likely revolutionize military logistics, intelligence, surveillance, and particularly weapons design in the future.[3] Currently, uncertainties surrounding AI and its military applications have sparked significant debate among military strategists. These discussions focus on AI's impact on warfare and the level of autonomy that should be granted to AI-powered weapons. A major concern is the use of lethal autonomous weapons systems (LAWS), or "killer robots," which operate without human intervention.

Furthermore, the technology shows the capability to execute tasks and address challenges at a level equivalent to human proficiency. Machines generated through AI present enhanced efficiency compared to conventional human methods. According to a 2019 survey, 37% of global organizations have integrated AI into operations.[4] The use has increased significantly, with 89 countries experiencing a remarkable 270% increase over the past four years, including a tripling within a single year.[5] AI was created to minimize the uncertainty and complexity of human behavior and replace with effective reasoning.

AI possesses several characteristics that merit careful consideration due to the relationship of the technology with the national security domain. Firstly, AI is a versatile technological paradigm with the potential for seamless integration into a myriad of applications. Secondly, numerous applications show dual-use capabilities, implying the applicability in military and civilian contexts. Image recognition algorithms can be trained for civilian purposes such as identifying individuals in YouTube videos while aiding the military in capturing terrorist activities through full-motion video (FMV).

This type of FMV is acquired by Remotely Piloted Aircraft (RPA) deployed over regions such as Syria or Afghanistan. Additionally, the deployment of AI in armed conflicts is exemplified by the implementation of Lethal Autonomous Weapons Systems (LAWS) in Israel. Thirdly, a level of transparency is shown that may not be immediately discernible on integration into a product. The presence represents the potential to address various challenges, with an expectation that AI will become an integral component in diverse applications, including defense technology. AI plays an important role in problem-solving across a spectrum of activities, solidifying the multifaceted landscape of technological advancements.[6]

Military organizations of states, particularly superpower states such as USA, as well as international military organization such as NATO are still trying to develop application technologies or concepts of war. The use of AI in armed conflict is considered to provide an advantage because the technology is different from conventional weapons with

[3] Payne, Kenneth. "Artificial intelligence: a revolution in strategic affairs?" *Survival: Global Politics and Strategy* 60, no. 5 (2018): 7-32.

[4] Benbya, Hind, Thomas H. Davenport, and Stella Pachidi. "Artificial intelligence in organizations: Current state and future opportunities." *MIS Quarterly Executive* 19, no. 4 (2020): 9-21

[5] Sethu, Sagee Geetha. "The inevitability of an international regulatory framework for artificial intelligence." In 2019 *International Conference on Automation, Computational and Technology Management* (*ICACTM*), pp. 367-372. IEEE, 2019.

[6] Khalil, Ahmad, and S. Anandha Krishna Raj. "Assessing the Legality of Autonomous Weapon Systems: An In-depth Examination of International Humanitarian Law Principles." *Law Reform* 19, no. 2: 372-392.

immediate countermeasures.[7] This can be seen in intellectual, logistics, cyberspace, control, and automated vehicles. Even though different breakthroughs have been experienced, the development of military AI technology is in the early stages. Based on research, the use of AI in armed conflict is very risky in terms of security.[8] Current security issues such as regional stability, conflict and war, transnational organized crime, terrorism, etc., will not be solved by AI making the technology inadvisable for military use. These issues are urgent and therefore imperative to be resolved effectively under international law since security issues pose threat to peace and national sovereignty. A threat to peace and national sovereignty would impede the very existence of international community including economic, social, cultural, and political aspects.

The development of AI for military purposes carries significant implications for global security strategies. According to Lynn-Jones,[9] when offensive capabilities hold greater advantage, the likelihood of conflict and warfare increases, whereas a stronger defensive position tends to promote peace and cooperation. Rickli,[10] further asserts that the impact of Artificial Intelligence on the balance between offense and defense, particularly with systems like AWS (Autonomous Weapon Systems), plays a crucial role in assessing AI's implications for strategic stability.

This concern is evident in the deployment of AI AWS, a contentious military application due to the capability to autonomously engage and eliminate targets without direct human intervention.[11] AWS as a form of AI used in armed conflict certainly causes unwanted casualties and violates the principles of laws of war. This weapon can identify and select targets as well as apply force to opponents without human intervention. An example of the use of AWS is the Israeli Harpy Loitering Weapon, owned by the State of Israel. The weapon can detect, attack, and destroy enemy radar transmitters and conceal torpedo mines that release a torpedo to lock onto a target when activated by a ship.[12]

The incorporation of AI in armed conflict shows a disparity between the increased intensity of military advancements and the susceptibility of society to the inherent risks.[13] The incorporation of AI in armed conflict reveals a stark disparity between the rapid advancements in military technology and the growing vulnerability of society to the associated risks. This gap underscores the urgent need for robust protective measures. Safeguarding the use of AI in warfare is a complex challenge due to the diverse

[7] Daniel S. Hoadley, and Nathan J. Lucas, *Artificial Intelligence and National Security* (Washington D. C.: Congressional Research Service, 2018), 36.

[8] Dresp-Langley, Birgitta. "The weaponization of artificial intelligence: What the public needs to be aware of." *Frontiers in artificial intelligence* 6 (2023): 1154184.

[9] Lynn-Jones, Sean M. "Offense-defense theory and its critics." Security studies 4, no. 4 (1995): 660-691.

[10] Rickli, Jean-Marc, and Federico Mantellassi. "Artificial intelligence in warfare: military uses of AI and their international security implications." In The *AI wave in defence innovation*, pp. 12-36. Routledge, 2023.

[11] Pedron, Stephanie Mae, and Jose de Arimateia da Cruz. "The future of wars: Artificial intelligence (ai) and lethal autonomous weapon systems (laws)." International Journal of Security Studies 2, no. 1 (2020): 2.

[12] Altmann, Jürgen. "Autonomous weapon systems–dangers and need for an international prohibition." In *KI 2019: Advances in Artificial Intelligence: 42nd German Conference on AI*, Kassel, Germany, September 23–26, 2019, Proceedings 42, pp. 1-17. Springer International Publishing, 2019.

[13] Nuriasih, Komang Ayu, and I Made Budi Arsika. "The Miserable Loss from Yemeni Conflict: Can International Law Provide Reparation for Mental Injury?." *Hasanuddin Law Review* 6, no. 1 (2020): 66-79.

perspectives from which regulation can be approached. The absence of an international framework that comprehensively addresses AI as a defense tool further complicates the matter. Currently, AI receives attention primarily within the realm of intellectual property laws, which protect inventions, rather than being regulated under humanitarian and war laws.

The challenge is exacerbated by the potential for AI to cause significant harm, raising critical questions about liability, especially when such harm results in casualties. Determining liability is particularly challenging given that AI functions as an indirect object, making it difficult to attribute responsibility clearly. The ambiguity surrounding liability for offenses, whether due to intentional malfunctions, product failures, or user negligence, highlights a significant research gap. Therefore, this research aims to fill this gap by examining the regulation of AI usage and the concept of liability for violations in armed conflict under international law. By addressing these issues, the study seeks to contribute to the development of a comprehensive legal framework that ensures the responsible and ethical use of AI in military operations.

2. Method

This research employs a normative legal approach to analyze principles, systematics, and comparisons within the context of AI usage in armed conflicts. The normative legal research method is descriptive in nature, aiming to detail data in order to uncover facts, identify issues, and discuss potential solutions. Initially, the research identifies the subject matter based on the problem formulation, which leads to a detailed breakdown of the sub-problems. This approach ensures a thorough examination of each aspect of the research question. Data collection method is carried through literature review, including case studies such as American Military's Utilazation of Drones during Afghan War, Israel-Palestine Conflict, Drones and Missiles launched recently by Iran Against Israel, etc. These case studies are crucial for understanding the real-world applications and implications of AI in military operations, particularly regarding threats and collateral damage to civilians. The analysis focuses on deriving insights from the literature review and case studies to understand the regulatory framework and liability issues associated with AI in armed conflicts.

3. Navigating the Legal Landscape of AI Regulation in Armed Conflicts Under International Law

3.1. The Evolution of Weaponry: Regulation of AI Under International Law

Article 19 of the Universal Declaration of Human Rights (UDHR) asserts, "Everyone has the right to freedom of opinion and expression, and this right includes freedom to hold opinions without interference, receive and impart ideas through media and frontiers." The important query arises: How can freedom of expression be upheld when public opinion is subject to influence by AI?

The advent of these new tools introduces novel challenges to the preservation of freedom. Even though innovative tools are provided for content creation, including audio and visual analytics, the impact on freedom of expression is refined. AI has the potential

to support the foundational principles of democracy and counteract corruption by enhancing freedom of expression. Striking a balance that safeguards freedom of expression while mitigating the risks posed by AI's influence on public opinion remains a challenge.[14]

The systems found in social media are also used to influence public opinion and to guide social movements by considering workflow optimization, automated content generation, content generation from old archives, content selection to target audience demographics, asset selection optimization, metadata generation, and content personalization. AI can personalize, generate, and filter content. This has implications for freedom of expression, social movements, and election campaigns. Questions arise regarding unreliable or false information published by the media but selected and continues to trend by AI.[15] How can the level of trust be determined in media manipulated by governments, advertisers, algorithms, or other third parties trying to persuade users and recipients of information?

Some AI systems are more efficient than humans at certain tasks such as mimicking the voices and images of others to influence people and create political change. Meanwhile, there is also the concept of machine learning software creating fake videos. The innovative technology by the Chinese tech giant Baidu has the capability to replicate a convincing artificial voice using 3.7 seconds of audio. Similarly, the concept extends to machine learning software, which has the potential to generate deceptive videos. In the same context, Montreal-based AI startup Lyrebird claims to be able to perform text-to-speech with one minute of audio.[16]

According to Article 12 of the Universal Declaration of Human Rights, "No individual shall be subjected to arbitrary interference with privacy, family, home or correspondence, or attacks on honor and reputation." However, a system that combines data from satellite imagery, facial recognition-powered cameras, and cell phone location information can provide an individual's movements. This technology can easily be used to facilitate more precise restrictions on freedom of movement at the individual and group levels as well as by foreign actors targeting political change. According to the OECD, AI is a transformative force, reshaping lives and impacting various sectors.[17]

In 2019, the Council of Europe established the Ad Hoc Committee on AI (CAHAI) working on "the feasibility and potential elements based on extensive multi-stakeholder consultations, of a legal framework for the development, design, and application of AI, based on Council of Europe standards on human rights, democracy and rule of law". Several international organizations are working on rules and legal frameworks related to ethics, such as the European Commission's High-Level Expert Group on AI (AI HLEG),

[14] Moşteanu, Narcisa Roxana and Kevin Galea, "Artificial Intelligence and Cyber Security - Face to Face with Cyber Attack a Maltese Case of Risk Management Approach." *ECOFORUM* 9 no. 2(22) (2020): 1-8.

[15] Stephan De Spiegeleire, Matthijs Maas, and Tim Sweijs, *Artificial Intelligence and The Future of Defense Strategic: Implications for Small- and Medium-Sized Force Providers* (Den Haag: Hague Centre for Strategic Studies, 2017), 2-5.

[16] Romagna, Marco and Niek Jan Van Den Hout, "Hacktivism and Website Defacement: Motivations, Capabilities and Potential Threats." *Virus Bulletin Conference* (2017), 1-8.

[17] Sharma, Gagan Deep, Anshita Yadav, and Ritika Chopra. "Artificial intelligence and effective governance: A review, critique and research agenda." *Sustainable Futures* 2 (2020): 100004.

which produced DRAFT Ethical Guidelines for Trustworthy AI. According to the draft of ethical guidelines prepared by AI HLEG, "objectives are used to show the development, application, and use of AI that ensures compliance with fundamental rights and applicable regulations, as well as respect for core principles and values. This is one of the two core elements for achieving Trustworthy AI".[18]

The initiative aims to prepare European countries for the tangible and intangible impacts of AI, including socio-economic changes, an objective conditioned by European values and guaranteed by an ethical and legal framework. Fundamental legal reforms and new policy actions that include the integration of stakeholders are required. The European Union is based on a constitutional commitment to protect the fundamental and indivisible rights of human beings as cited in Articles 2 and 3 of the Treaty on European Union and the Charter of Fundamental Rights of the European Union. The ethics in AI are reflected in the statement of principles, values, and rights.[19]

Additional global and regional frameworks focus on the application of AI with a human-centered approach. For instance, G20 AI Principles, adopted by the Ministers of Trade and Digital Economy in June 2019, draw inspiration from OECD recommendations on AI. The objective is to integrate a human-centric perspective into AI, representing the sole means to ensure human rights and democracy in AI era. According to the principles, trust in AI stands at the forefront and necessitates contributions from all stakeholders. Trust is shown as the primary principle, serving as the cornerstone for upholding human rights, democracy, and sustainable development. As articulated in the principle, AI actors must adhere to the rule of law, human rights, and democratic values throughout the life cycle of the systems. These include freedom, dignity, autonomy, privacy and data protection, non-discrimination and equality, diversity, fairness, social justice, and internationally recognized labor rights.[20]

The document is a call to action and contains recommendations that require the inclusion of all stakeholders. Part of the document is dedicated to solutions and policy actions adopted by different countries and shows the importance of international cooperation. A more contemporary example of ethical principles is the G7 (2018) Charlevoix Common Vision for the Future of AI, ratified in Charlevoix, Canada, in June 2018 by the leaders of Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. This set of principles comprises 12 commitments and AI relies on a steady policy environment to nurture innovation.

Several actions are recommended to member states based on an "ethical and technologically neutral approach" as stated in the first commitment of vision. The latest examples of such guidelines include the declaration by the African Union Working Group on AI, which Sharm El Sheik declared as adopted by African ministers responsible for communications and information and technologies (CICT) in Egypt on October 26, 2019. This important legal framework confirms that international community is dedicated to

[18] *Ibid.*

[19] Petri Vähäkainu, and Martti Lehto, "Artificial Intelligence in the Cyber Security Environment." *Proceedings of the 14th International Conference on Cyber Warfare and Security ICCWS2019* (2019): 432-433.

[20] Grant, Carl A., and Melissa Leigh Gibson. ""The path of social justice": A human rights history of social justice education." *Equity & Excellence in Education* 46, no. 1 (2013): 81-99..

the importance of ethics in AI, including the development of rules and strategic measures to face the challenges imposed by AI and the importance of updating international law.

Directly, AI generates new legal situations by creating new entities or by enabling new behaviors. Indirectly, the technology can shift incentives or values for states interacting with international law. Therefore, three types of legal effects affected by disruptive technology can be distinguished. The first is legal development, comprising elemental changes that lead to the need for legal change to accommodate or address new situations. The second is legal displacement, which includes the systemic substitution of regulatory modalities, and 'automation' of international law. Meanwhile, the third is legal destruction, constituting systemic disruption of key venues and erosion. These legal effects are examined to understand the conditions under which AI may result in manageable development or change.[21]

Technology creates an immediate need for new sui generis rules to deal with situations or forms of behavior.[22] AI enables new forms of behavior that are morally problematic or politically or strategically disruptive. This includes systematic monitoring and control of populations through enhanced surveillance, deployment of fully autonomous weapons, and tracking of rival nuclear assets in ways that threaten deterrence stability. The behavior may be considered dangerous and undesirable, creating the need and conditions for new treaties to explicitly prohibit or control the development, deployment, or use of the systems. In the context of international law, this may echo past arms control efforts, such as the 1968 Treaty on the Non-Proliferation of Nuclear Weapons or the 1972 Treaty on the Limitation of Anti-Ballistic Missile Systems. Even though the establishment of new technology-specific treaty regimes to address gaps is not politically easy, international legal system is capable of proposing and disseminating new legal regimes to address gaps opened by new technologies.

Technology creates uncertainty about the application of new behavior to existing law. This includes uncertainty in the classification of new activities, entities, or relationships because there is no adequate classification. Therefore, there is an increased need to clarify and shape the existing legal rules. Matthew Scherer argues that the autonomy, and opacity of certain AI systems can create uncertainty over attribution, control, and responsibility. According to Thomas Burri, the case law of international courts, such as International Tribunal for the Former Yugoslavia or International Court of Justice (ICJ), includes more than enough precedents to resolve issues of state control, attribution, and delegation limits. Even though judicial clarifications are not available, new legislation, treaties, or customary international law can close the gap to provide the necessary conceptual clarifications surrounding AI system.

The new technologies create a new context that leads to inclusiveness and over-inclusiveness of laws. Previously unproblematic laws are suddenly found to have an inappropriate scope. For example, some arguments are completely on legal grounds rather than ethical or philosophical to give certain algorithms a semblance of personality.

[21] Kandhro, Sirajul Haque. "Roles of E-Government in Enhancing Good Governance of Public Sector Organizations in Pakistan." *National Institute of Development Administration* (2011): 9-61.

[22] Goralski, Margaret A., and Tay Keong Tan. "Artificial intelligence and sustainable development." *The International Journal of Management Education* 18, no. 1 (2020): 100330.

Shawn Bayern argued that a loophole in existing US corporate law might allow the incorporation of the limited liability company (LLC) under the operational control of AI system. Even though courts were reported not to interpret the relevant legislation, the result was contrary to legislative intent. This was because Bayern and others extended the argument to the German, Swiss, and English legal systems.[23]

In the following discussion, the legal review of AWS is based on international treaty, whose provisions are considered to be closest to the characteristics of AWS, namely the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons (the 1980 Conventional Weapons Convention). In the 1980 Conventional Weapons Convention, there was general agreement among state parties that "meaningful" or "effective" human control or supervision, or an "appropriate level of human judgment" must be maintained on the use of a weapon system to meet legal and ethical requirements. This is certainly difficult to fulfill by the characteristics of AWS because human inclusion is limited to the development and activation stages. Meanwhile, the operation stage of AWS does not require human intervention, and this results in a real threat when there is a failure in the operating system.

As explained earlier, legal review can also be based on the Martens Clause contained in the Preamble of Hague Convention IV respecting Laws and Customs of War on Land (Convention IV Den Hagg 1907), which reads as follows:

> *"Until a more complete code of the laws of war is issued, the High Contracting Parties think it right to declare that in cases not included in the adopted Regulations, populations, and belligerents remain under the protection and empire of the principles of international law, resulting from the usages established between civilized nations. This is related to the laws of humanity and the requirements of the public conscience."* [24]

Based on the provisions, the Martens Clause is intended for events or problems not regulated in the provisions of International Humanitarian Law. Therefore, when there is a void or gap in positive law, the solution taken must be based on basic humanitarian principles and general awareness.[25] The purpose of the clause is to prevent the possibility of leaving unregulated matters to the arbitrary opinion of commanders. The principle of humanity requires humane treatment of other individuals and respect for life and dignity. Due to these characteristics, AWS neglects to uphold human dignity by relying on algorithmic calculations embedded in computer systems for determining matters related to human life and death, as well as targeting attack objectives. The characteristics also run counter to common sense since AWS incorporates the concept of a weapon system that executes the use of force and attacks beyond human control.

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[23] De Sousa, Weslei Gomes, Elis Regina Pereira de Melo, Paulo Henrique De Souza Bermejo, Rafael Araújo Sousa Farias, and Adalmir Oliveira Gomes. "How and where is artificial intelligence in the public sector going? A literature review and research agenda." *Government Information Quarterly* 36, no. 4 (2019): 101392.

[24] Mero, Theodor. "The Martens Clause, principles of humanity, and dictates of public conscience." *American Journal of International Law* 94, no. 1 (2000): 78-89.

[25] Kusumo, Ayub Torry Satriyo, and Kukuh Tejomurti. "Alternatif atas Pemberlakuan Hukum Humaniter Internasional dalam Konflik Bersenjata Melawan Islamic State of Iraq and Syria." *Yustisia* 4, no. 3 (2015): 639-664.

AI Technologies in warfare consist of various weaponary machine leraning type such as drones, surveillance systems, etc. These machines have been regularly used in various warfare cases, such as in Afghan War, Syirian Civil War. International law has regulated the use of weapons in armed conflict as reported in the 1907 Hague Convention, where agreement was formed before the First World War. This regulation mentions the weapons and actions in armed conflict as stated in Article 23 of the convention. In this article, only two weapons are prohibited, namely, poisons and certain weapons, projectiles, or materials causing unnecessary suffering. [26]

As highlighted in the Special Rapporteur's 2013 report to the General Assembly, the legality of using armed drones lethally under international law hinges on a number of legal considerations, such as:

a. Whether the international law principle of self-defense allows for preemptive lethal drone strikes, given the broad potential interpretations of responding to an imminent threat;
b. The paragraph questions two key issues: First, whether lethal drone strikes can be justified under the doctrine of self-defense when targeting a foreign state's territory in response to a threat from a non-state actor, especially when that state is unwilling or unable to prevent the attack. Second, whether strikes that occur outside specific geographical areas of armed conflict should be governed by International Humanitarian Law (IHL) rules on targeting individuals.

The Special Rapporteur observes that while States have been implementing lethal drone strike policies abroad, international law has increasingly recognized that States' human rights obligations extend beyond their own borders. States can no longer assume that their actions abroad are unrestricted, even when those actions occur outside the scope of armed conflict and may not be governed by the rules of International Humanitarian Law (IHL). The use of "Agent Orange" by the United States Army in the Vietnam War is an example of a violation of Article 23 of the 1907 Hague Convention. "Agent Orange" was a toxic herbicide and defoliant weapon used to injure Vietnamese guerrillas.[27] The civilians were also affected since the poison contaminated natural resources in conflict zone.

According to Article 23 of the 1907 Hague Convention, the use of AI Weapons in armed conflict is certainly not prohibited provided weapon is non-toxic and does not cause unnecessary or excessive suffering. For example, a drone that hits a military base automatically is a weapon with AI technology similar in nature to missiles. It is a weapon used to attack enemy bases without poison and does not cause unnecessary suffering. Even though the drone is AI weapon, no complain is stated since the provisions listed in the 1907 Hague Convention are not violated.

[26] Sulistia, Teguh. "Pengaturan perang dan konflik bersenjata dalam Hukum Humaniter Internasional." *Indonesian J. Int'l L.* 4 (2006): 526.

[27] Stellman, Jeanne Mager, and Steven D. Stellman. "Agent Orange during the Vietnam War: the lingering issue of its civilian and military health impact." *American Journal of Public Health* 108, no. 6 (2018): 726-728.

There is an urgent need for comprehensive regulations governing the use of AI and autonomous weapon systems in warfare. Specific regulations should be established to control and limit the deployment of these technologies. The use of AI in warfare must adhere to international law principles, particularly those of distinction, proportionality, and necessity, to ensure the protection of all individuals, especially civilians. Under international law, these principles must guide military practices, ensuring that non-military targets, such as roads and other public infrastructures, are not subjected to attacks by AI-driven technologies like drones and missiles. This approach is crucial to minimize collateral damage and uphold humanitarian standards in armed conflicts.

3.2. The Concept of Responsibility for Violations in the Use of AI in Armed Conflicts Under International Law

AI weapons have destructive power useful for combating opponents but the impact may cause damage to civilian buildings and lives. For example, Israel's non-AI weapons have destroyed many civilians and buildings in Gaza. This violates the 1949 Geneva Convention, which provides for the protection of civilians and wounded soldiers.[28] Therefore, AI or non-AI weapons constitute a violation after engaging in attacks against civilians and structures in compliance with the provisions outlined in the 1949 Geneva Convention. However, AI weapons have a higher potential and possibility to cause massive and fatal destruction. A regulation useful for limiting the use and development of these weapons is necessary to prevent the destructive power.

Commanders of the army are responsible for the performance of the forces subject to authority. In US joint force doctrine, the term "command" includes the authority and responsibility to organize, direct, coordinate, and control military forces to accomplish the mission. Furthermore, it includes responsibility for the health, welfare, morale, and discipline of all subordinates. The art of command flows from the commander's ability to use leadership to maximize performance. The clear guidance and intentions, enriched by experience and intuition, enable the joint force to achieve different objectives.[29]

Commanders bear the weight of responsibility for battlefield actions, irrespective of whether subordinates make and amplify mistakes, machines deviate unexpectedly, or incidents unfold as unforeseen consequences of pure chance or the complexities inherent in the fog of war.[30] The military doctrine of command accountability may not look "fair" because the commander is responsible for every decision made throughout armed forces and the prosecution of the war effort. Direct accountability includes every aspect of the outcome of specific decisions made by subordinate leaders and service members, failures of intelligence and mission analysis, mistakes of the government and civilian private sector accompanying forces, and faulty weapons performance.

[28] Turlel, Anastasya. "Perlindungan Penduduk Sipil Dalam Situasi Perang Menurut Konvensi Jenewa Tahun 1949." *Lex Crimen* 6, no. 2 (2017): 147-148.

[29] National Cyber and Crypto Agency of Indonesia. "Pembentukan Badan Siber Dan Sandi Negara." https://www.bssn.go.id/pembentukan-badan-siber-dan-sandi-negara-bssn/ (accessed May 30, 2023).

[30] Allam, Zaheer and Zaynah A Dhunny, "On Big Data, Artificial Intelligence and Smart Cities." *Cities* 89 (2019): 80-91, https://doi.org/10.1016/j.cities.2019.01.032.

The military commander is responsible for the totality of the use of the forces, from the gun to the nuclear missile. In this context, criminal, non-judicial, and administrative liability are faced. The direct liability for almost every attempt at prosecuting war is a strict regime without criminal sanctions. Even though the responsibility may comprise legal disclosure of criminal violations of laws related to warfare, non-judicial and non-legal mechanisms are included in military doctrine. Liability is separate and distinct from the related legal doctrine in international criminal law of command responsibility. The commanders can face legal jeopardy for failure to exercise control over forces under command in violation of LOAC. Meanwhile, lethal force is authorized against enemies and lawful targets under the rules of engagement and subject to LOAC.

These orders are informed by the understanding of the tactical situation, training and experience, and the combination of tactics and weapons. In the case of AI, commanders are responsible for calibrating the use of AWS, "express autonomy", and setting parameters or "guardrails" for operations. The military system holds the commander accountable for failing to anticipate or guard against harm when an autonomous system acts outside its programmed boundaries. The leaders in command have the authority to deploy weapons and bear responsibility when the machinery malfunctions. These individuals are answerable to superiors in the chain of command for the strategies and tools of war initiated, ranging from missiles in flight to artillery shells discharged from tubes.

The accountability extends to AWS, capable of locating targets based on programmed criteria. Commanders are held accountable for instances such as troops firing incorrect or misdirected rounds, weapons failing to perform as anticipated, and errors occurring across the entire kill chain when using systems with autonomous functionalities. This accountability includes both criminal and administrative liability, where personal exposure or responsibility is assumed for the weapons discharged and may face sanctions for violations of laws. The pursuit of advances in weapon systems to ensure an effective, efficient, and more humane approach to warfare has been successful due to the coupling with a culture of accountability in battlefield leadership.

Ethical issues are crucial in the utilization of AI technology in warfare. It is imperative that civilians and non-military compounds are not targeted during conflicts to uphold human rights protection. The rise of AI introduces new challenges in international law and human rights, often referred to as "the Age of AI" in legal discussions. This evolution necessitates a reevaluation of international law and the integration of ethical considerations in AI development to ensure security and manage inter-state tensions. Addressing the ethics of AI is essential, presenting a novel dilemma that requires a comprehensive legal response from the international community. Now, more than ever, the international community must prioritize AI ethics, with several intergovernmental organizations already focusing on this critical issue.[31]

[31] Fatima Roumate, Artificial Intelligence, Ethics and International Human Rights Law, International Review of Information Ethics, Vol. 29 (03/2021), Page 9

3.3. Exploring Real-World Applications: Case Studies on AI-Induced Warfare

Case studies such as Afghan War and Israel-Palestine Conflict for instance have evidently shown international community on how wise we are supposed to be in utilizing AI Technology Warfare to avoid collateral damage and civilian casualties.The Cuban Missile Crisis of the Cold War, which almost led to nuclear conflict, exemplifies the crucial importance of autonomous weapon systems (AWS) and target recognition.[32] The US Naval Forces' Autonomous Weapons System and Target Recognition could have averted this crisis. Following the conflict, both the United States and the Soviet Union emphasized deterrence and wartime stability, incorporating lessons to make AI-driven military decisions less predictable and more precise. While World Wars introduced AI to defense, its development accelerated in scenarios similar to this crisis.[33]

Israel-Palestine conflict has also opened our eyes in terms of AI Warfare Technology utilazation. Thousands of civillians, women and children, public facilities, including Mosques, have been destroyed by Israeli military drones. The 2021 conflict between Israel and Hamas showcased how the Israeli Defense Force (IDF) utilized an advanced AI technology platform. This platform centralized data on terrorist groups in the Gaza Strip into a single system, allowing for efficient analysis and intelligence extraction. The ability of this AI on big data analysis accurately mapped and destroyed Hamas' extensive underground tunnel network.[34]

The United States and China have made significant investments in AI command-and-control systems, especially focusing on establishing a "shared operational view.".[35] The United Kingdom has also integrated AI into training exercises to support operational command and control. This AI collects and analyzes data to provide information about the environment and terrain, offering immediate planning support and improving the command-and-control processes.[36] Syirian civil war is also something which should be looked upon in terms of AI. Military drones as part of AI have also been frequently used, even as far as causing civillian casualties.

The aforementioned cases all accross the globe which AI Warfare Technology has been used for years, indicate clearly that in terms of its utilization, AI Warfare Technology must be limited under international law so that it won't cause civillian casualties and collateral damage during armed conflict.

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[32] Horowitz, Michael C. "When speed kills: Lethal autonomous weapon systems, deterrence and stability." In *Emerging technologies and international stability*, pp. 144-168. Routledge, 2021.

[33] Rashid, Adib Bin, Ashfakul Karim Kausik, Ahamed Al Hassan Sunny, and Mehedy Hassan Bappy. "Artificial intelligence in the military: An overview of the capabilities, applications, and challenges." *International Journal of Intelligent Systems* 2023, no. 1 (2023): 8676366.

[34] Ahronheim, Anna. "Israel's operation against Hamas was the world's first AI war." *The Jerusalem Post* 27 (2021). Retrieved from: https://www.jpost.com/arab-israeli-conflict/gaza-news/guardian-of-the-walls-the-first-ai-war-669371. Accessed on June 21, 2024

[35] Sayler, Kelley M. "Artificial intelligence and national security." Congressional Research Service 45178 (2020). Retrieved from: https://sgp.fas.org/crs/natsec/R45178.pdf, Accessed on April 19, 2024

[36] Rickli, Jean-Marc, and Federico Mantellassi. "Artificial intelligence in warfare: military uses of AI and their international security implications." In *The AI wave in defence innovation*, pp. 12-36. Routledge, 2023.

3.4. Forthcoming prospects on AI in Warfare

International community in responding to AI Warfare technology has been varied. For superpowers such as USA, China, Russia, they all have developed AI based warfare technology in enhancing their military defense system. For other countries, particularly developing countries, AI Warfare technology is also used in enhancing their military defense system, although not as excessive as developed countries due to their distinct economic growth.

In the Middle East, the advancement of AI will have significant economic, legal, security, and political effects. Without proactive measures by regional states, these advancements could exacerbate existing arms races, leading to severe negative outcomes. With several major countries aiming to capitalize on the AI market in the Middle East, regional states need to coordinate, plan, and develop policies to avoid exploitation. Moreover, recent technological innovations, such as UCAVs, have already changed the dynamics of the arms race, presenting challenges to all involved parties.[37]

Advancements in AI technology are poised to revolutionize robotics and autonomous systems, dramatically transforming the landscape of future warfare and reshaping military dynamics. Often hailed as the "third revolution in warfare" or the "fourth industrial revolution," autonomous weapons and robotics hold the potential to be as transformative as the introduction of gunpowder and nuclear weapons.[38] Several leading researchers argue that AI has reached a pivotal moment, suggesting that autonomous armed unmanned aerial vehicles (UAVs) could be deployed within a few years, regardless of legal and ethical considerations.[39]

AI will indeed enhance military organizations and equipment all over the world even more in years to come. In that regard, it is the military commanders who have the decision whether or not to utilize AI Warfare technology in accordance with ethical and international legal framework. In that regard, Recognizing AI's potential to enhance human efficiency in ethical decision-making, it is essential for individuals, especially military commanders, to strive to establish objective criteria to pinpoint an AI system's optimal balance. AI systems should be classified and linked to specific situational conditions (such as urgency or the volume of information to be processed) so that users can determine which systems are most beneficial for their needs.[40]

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[37] Sarkin, Jeremy Julian, and Saba Sotoudehfar. "Artificial intelligence and arms races in the Middle East: the evolution of technology and its implications for regional and international security." *Defense & Security Analysis* 40, no. 1 (2024): 97-119.

[38] To date, only the United States, United Kingdom, and Israel have reportedly used armed drones operationally. However, other nations such as China, Germany, Italy, and France have shown a keen interest in developing this capability. Despite this interest, no country has formally declared an intention to build fully autonomous weapon systems.

[39] The moral and ethical considerations related to the use of autonomous control weapons and autonomous targeting is complex and highly contested; humans creating technology to an attack human is inherently problematic. See: Roff, Heather, and Richard Moyes. "Autonomy, robotics and collective systems." Global Security Initiative, Arizona State University (2016).

[40] Nalin, Lieutenant Colonel Alessandro, and Paolo Tripodi. "Future warfare and responsibility management in the AI-based military decision-making process." *Journal of Advanced Military Studies* 14, no. 1 (2023): 83-97.

4. Conclusion

International humanitarian law currently lacks explicit regulations for AI, highlighting the urgent need for a new framework that sets limits on advanced weaponry without resorting to outright bans. Autonomous weapons, which can operate independently without human oversight, may struggle to adhere to principles such as non-discrimination, distinction, military necessity, and proportionality. However, the principle of humanity remains critical, as states can still be held accountable under international law for deploying AI technologies. Proving violations of orders by commanders has always been challenging, and the unique nature of AI exacerbates this difficulty. Unlike human soldiers, AI lacks moral agency and the hierarchical relationships inherent in national armed forces, complicating the establishment of culpability. Thus, regulations for AI must be designed to ensure compliance with established international legal procedures.

The 1907 Hague Convention, which governs weapons in armed conflict, is too broad and outdated to address the complexities of AI-integrated weapons. As nations increasingly develop these technologies, there is an urgent need for regulations specifically tailored to these advancements. This is crucial to prevent the creation of dangerous AI weapons and to ensure the effective protection of human lives. Responsibility for AI or autonomous weapons spans multiple roles, including fighters, military commanders, developers, and designers. Determining who controls these systems is complex, underscoring the need for regulations that assign a responsible overseer to each AI weapon. Such measures are essential to ensure accountability when international humanitarian laws are violated, thus safeguarding both ethical standards and human safety in the era of AI warfare.

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