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Autonomous Weapons Systems and Victims' Rights: Assessing the Role of Meaningful Human Control

JAMM07 Master Thesis

International Human Rights Law

30 higher education credits

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Term of graduation: Spring 2026

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Summary

In the last decades, there is growing concern about increasing delegation of life-and-death decisions to Autonomous Weapons Systems (AWS), powered by artificial intelligence (AI), which may undermine compliance with international legal principles and weaken accountability for unlawful harm. In particular, this thesis examines the impact of AWS on the protection of victims under International Humanitarian Law (IHL) and International Human Rights Law (IHRL), focusing on the role of Meaningful Human Control (MHC) as a potential legal safeguard.

The topic is significant because AWS challenge the traditional assumption that human judgment governs the use of force. Core principles such as distinction, proportionality, precaution, and the right to life rely on human control and responsibility. As autonomous systems increasingly operate with reduced human involvement, important legal questions arise; for instance, regarding civilian protection, attribution of responsibility, and victims' access to remedies.

The research adopts a doctrinal legal methodology combined with critical normative analysis, based on the analysis of international treaties, UN reports, academic literature, policy documents, and expert commentary concerning AWS, IHL, and IHRL.

The thesis finds that AWS risk creating accountability gaps and weakening the effective protection of victims' rights. Although MHC is not a complete solution to the legal and ethical challenges posed by AWS, it can function as an important safeguard for preserving human responsibility, accountability, and access to remedies under international law.

Preface

I wish to dedicate this thesis, the product of two years of hard work, to my parents. I am extremely fortunate to have always had them by my side. I owe them my every achievement; their constant encouragement carries me through every challenge, and their love allows me to believe in myself.

During these two years abroad, I felt the support of every loved one back in Italy. A special thanks goes to my brother Lorenzo; after growing up side by side, being far away from him felt especially strange. I am also deeply grateful to my grandmother, whose weekly phone calls filled me with love and encouraged me to follow my dreams.

I feel truly blessed to have Beatrice, Ginevra, and Matilde in my life; despite the distance, our friendship has not changed but has grown stronger. I am deeply grateful to have come to understand the meaning of true friendship through their constant presence in both the highs and the lows.

I would like to express my sincere thanks to my supervisor Jessica Almqvist, who guided me in the development of this thesis. Her expertise, motivation, and kindness have been significant in shaping my work.

Finally, thanks to everyone I encountered along the way; every smile, laugh, and moment spent together made my experience more fulfilling.

This master's programme gave me the opportunity to learn a great deal, not only as a student, but as a person; I will carry this entire journey with me for the rest of my life.

Abbreviations

AI	Artificial Intelligence
AP I	Additional Protocol I
AWS	Autonomous Weapons Systems
CCW	Convention on Certain Conventional Weapons
ECHR	European Convention on Human Rights
ECtHR	European Court of Human Rights
GGE	Group of Governmental Experts
ICL	International Criminal Law
ICRC	International Committee of the Red Cross
IHL	International Humanitarian Law
IHRL	International Human Rights Law
LAWS	Lethal Autonomous Weapons Systems
LOAC	Law of Armed Conflict
MHC	Meaningful Human Control
NGO	Non-Governmental Organization

INTRODUCTION

Artificial intelligence (AI) has become an integral part of modern society, from daily tasks to the frontlines. In particular, the emergence of autonomous weapons systems (AWS), operated by AI, marks the shift from human-led combat to a new era of warfare where machines can operate independently. The rise of autonomous weapons is a relatively new phenomenon. Even if machines with autonomous capabilities have existed since the mid-20th century, from the 2000s highly advanced systems have been deployed, and they are in continuous evolution. Their development and deployment have introduced significant challenges across several domains, most notably in military planning, ethics, and legal frameworks.[1] On a strategic level, the primary challenges involve the rapid spread of these technologies, the triggering of new arms races, and a heightened danger of rapid conflict escalation. Moreover, the military faces a disruption of the conventional chain of command, while ethical debates concentrate primarily on the dehumanization of war. From a legal standpoint, the core of this thesis, the discourse focuses on whether these systems can actually comply with International Humanitarian Law (IHL) and International Human Rights Law (IHRL).[2] Both these legal regimes are traditionally built on the assumption that human actors exercise judgment and control in decisions concerning the use of force. Principles such as distinction, proportionality, and precaution require context-sensitive assessments that have traditionally depended on human evaluation. Furthermore, accountability mechanisms under international law rely on the identification of human agents capable of bearing responsibility for unlawful conduct. However, AWS introduce varying degrees of autonomy that may reduce or displace the human component in targeting and operational decisions. This shift from human judgment to algorithmic processes raises complex legal concerns regarding compliance with existing legal obligations, the attribution of responsibility for unlawful harm, and the effective protection of victims.[3]

It is important to notice that there is already extensive scholarly research on the technological, military, ethical, and strategic implications of AWS; however, the specific impact that these systems have on victims and their rights under international law remains a relatively unexplored area of study. As it will be analyzed in this thesis, the deployment of AWS raises concerns regarding the attribution of responsibility for unlawful harm, the fulfillment of procedural

[1] Petra Perišić, 'Killed by Robot or Human: Considerations on Autonomous Weapons Systems and Human Dignity' (2025) 73(3) *Anali Pravnog fakulteta u Beogradu*, p. 438 https://www.researchgate.net/publication/395947216_Killed_by_Robot_or_Human_Considerations_on_Autonomous_Weapons_Systems_and_Human_Dignity

[2] Daniele Amoroso and Guglielmo Tamburrini, 'Autonomous Weapons Systems and Meaningful Human Control: Ethical and Legal Issues' (2020) 1 *Current Robotics Reports*, pp. 188-189 https://www.researchgate.net/publication/343844421_Autonomous_Weapons_Systems_and_Meaningful_Human_Control_Ethical_and_Legal_Issues

[3] Noone Gregory and Noone Diana, 'The Debate over Autonomous Weapons Systems' (2015) 47 Case Western Journal of International Law, p. 29 https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=1005&context=jil

obligations such as investigations and accountability, and the effective enjoyment of victims' rights to remedies. The reduction of direct human involvement in the use of force risks creating accountability gaps that may weaken the protection afforded to individuals harmed during armed conflict. In response to these concerns, increasing attention has been devoted to the concept of Meaningful Human Control (MHC) as a possible safeguard aimed at preserving human responsibility and ensuring legal accountability in the use of autonomous force.

Research aim

The main aim of this thesis is to understand how the reduction or displacement of human judgment in the operation and decision-making of AWS affects the legal protection afforded to individuals harmed by the force deployed by these autonomous machines. In particular, this work examines the relationship between AWS and the protection of victims offered by IHL and IHRL, focusing on the legal challenges created by these AI-based systems, the implications for responsibility and accountability, and the practical access to remedies and redress available to victims. Furthermore, it analyzes whether the requirement of MHC can contribute to maintaining effective protection for victims and accountability under existing frameworks of international law in the context of autonomous warfare.

Research question

The main research question of this thesis is:

"How does the use of Autonomous Weapons Systems affect the protection of victims under International Humanitarian Law and International Human Rights Law, and can the requirement of Meaningful Human Control be understood as a legal safeguard for victims' rights?"

Methodology

This thesis adopts a legal doctrinal methodology combined with a critical normative analysis[4]. The research is based on both primary and secondary sources. Primary sources used are international humanitarian law treaties, international human rights law treaties, and UN reports. Additionally, secondary sources include academic literature, policy reports, expert commentaries, and reports from international organizations.

Moreover, this thesis critically evaluates whether existing legal concepts are sufficient to address the challenges posed by autonomous decision-making in armed conflict, in particular from the perspective of accountability and victim protection.

[4] P Ishwara Bhat, *Idea and Methods of Legal Research* (Oxford University Press 2020)

Scope and limitations

The scope of this thesis is limited to the impact that lethal autonomous weapons systems have on the protection of victims in the context of armed conflict under the scope of IHL and IHRL. This work does not provide assessments on broader strategic, military, or geopolitical considerations relating to the deployment of AWS. Furthermore, it does not present a technical analysis of how AWS function in practice on the battlefield. Ethical and technological discussions are considered only insofar as they are necessary to understand the legal issues examined throughout the thesis.

Outline

This research is divided into a general introduction, four material sections and a conclusion.

The first material section is "Chapter 1 - Autonomous weapons systems: conceptual and operational framework". This chapter provides the conceptual and theoretical framework by defining AWS and analysing different degrees of autonomy. It demonstrates how these systems reduce or transform human involvement in the targeting process, highlighting the risks arising from autonomous decision-making.

"Chapter 2 - Applicable legal framework under International Humanitarian Law and International Human Rights Law" sets out the relevant legal standards governing the use of force and the protection of individuals. It emphasizes that both IHL and IHRL rely on human judgement for the application of principles such as distinction, proportionality, precaution, as well as for ensuring accountability and remedies.

In "Chapter 3 - Victims of Autonomous Weapons Systems", the conceptual and legal frameworks developed in the previous chapters are applied to examine how AWS affect victims in practice. Here the concept of victim, types of harm caused by AWS, and the challenges relating to accountability and access to remedies are analyzed. This section demonstrates that the displacement of human judgment leads to gaps in the effective protection of victims' rights.

"Chapter 4 - Meaningful Human Control as a safeguard for victims' rights" analyses the concept of MHC and its emergence in legal and policy discussions. This chapter also discusses the limits of MHC arguing that it is not a solution to all problems posed by AWS; however, it can function as a useful legal lens. Then, MHC is analyzed from a victim centered perspective, pointing out how it could be applied across the full lifecycle of an AWS, with particular attention to accountability safeguards, and how it could improve victims' access to remedies.

Finally, the conclusion synthesises the finding of this thesis, reflecting on the broader implications for the regulation of AWS and the protection of victims under international law.

CHAPTER 1 – AUTONOMOUS WEAPONS SYSTEMS: CONCEPTUAL AND OPERATIONAL FRAMEWORK

1.1 Defining autonomous weapons systems

There is no internationally agreed definition of autonomous weapons systems (AWS). Therefore, various understandings have emerged in the practice of states, international organizations, and non-governmental organizations (NGOs). This term AWS is used to describe a wide range of systems operating with different degrees of autonomy, from partially automated functions to systems capable of completing tasks in autonomy.[5]

The difficulty in identifying a precise definition lies in the competing views of the notion of autonomy, which is a challenging concept to grasp and it is often used incorrectly. Autonomy should not be confused with how this term is used in other environments, such as philosophy ("the ability to make your own decisions without being controlled by anyone else"[6]) or politics ("the right of an organization, country, or region to be independent and govern itself"[7]). In the realm of systems, autonomy corresponds to a system's capacity to perform its activities and reach its goals without external intervention[8]. Hence, an autonomous system is capable of taking action in a number of different scenarios without human oversight and control, even though human involvement may still be present depending on the characteristics of the particular system.[9]

In fact, in robotics, autonomy is more related to the term "automatic", meaning a system that is configured with a number of predefined alternative actions that are selected by the system in reaction to certain inputs. In this sense, autonomous weapons systems are those systems capable of selecting and engaging with a target without human involvement.[10]

Precise definitions of key terms are essential for systematic knowledge as they enable common understanding and informed discussions about AWS. Although there is no shared view among scholars, definitions of AWS can be found in documents produced by state bodies and NGOs. For instance, the US Department of Defense defines an AWS as:

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[5] Emily Crawford E and Alison Pert, *International Humanitarian Law* (3rd edn., Cambridge University Press 2024)
[6] Cambridge Dictionary, 'AUTONOMY | Meaning in the Cambridge English Dictionary' (*Cambridge.org* 2019) https://dictionary.cambridge.org/dictionary/english/autonomy
[7] Ibid.
[8] Jason Lee, 'Autonomous Weapons, War Crimes, and Accountability' (2025) 49 N.C. J. INT'L L., p. 3-4 https://scholarship.law.unc.edu/ncilj/vol49/iss2/4
[9] Andrew Williams and Paul Scharre, 'Autonomous Systems Issues for Defence Policymakers Headquarters Supreme Allied Commander Transformation' (2015), p. 33
[10] Noone and Noone (n. 3) 27-28

> "a weapon system that, once activated, can select and engage targets without further intervention by an operator. This includes, but is not limited to, operator-supervised autonomous weapon systems that are designed to allow operators to override operation of the weapon system, but can select and engage targets without further operator input after activation".[11]

Similarly, the International Committee of the Red Cross (ICRC) defines them as "any weapon system with autonomy in its critical functions. That is, a weapon system that can select (i.e. search for or detect, identify, track, select) and attack (i.e. use force against, neutralize, damage or destroy) targets without human intervention".[12] This is a purposefully broad definition that includes some existing weapons systems and can also encompass emerging technology developments.

For the purposes of this thesis, the definition of the ICRC will be used. Accordingly, what constitutes an AWS is that it can select and engage targets without simultaneous human involvement. The choice of this definition reflects its functional focus on critical decisions of the machine and their relevance to the protection of individuals under IHL and IHRL.

The plurality of existing definitions further illustrates that autonomy exists along a spectrum rather than as a binary condition, present or not in the functions of a system. An examination of the varying degrees of human involvement in weapons systems is therefore necessary to understand the legal implications of AWS and to assess the extent to which human control remains embedded in the use of force.

1.1.1 Degrees of autonomy and human involvement

What sets different kinds of AWS apart is not the type of weapons they use; instead, it is their level of autonomy, meaning how these systems take their decisions.[13] Therefore, autonomy can not be simply understood as a binary divide between autonomous and non-autonomous devices; rather, it must be conceptualized as a spectrum. It is more accurate to examine the varying degrees to which human operators participate in or supervise the critical functions performed by these machines.[14] As it will be demonstrated in later chapters, this analysis is useful to

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[11] Department of Defense, *DoD Directive 3000.09: Autonomy in Weapon Systems* (2023) https://www.esd.whs.mil/portals/54/documents/dd/issuances/dodd/300009p.pdf

[12] International Committee of the Red Cross, Views of the ICRC on Autonomous Weapon Systems (Convention on Certain Conventional Weapons, Meeting of Experts on Lethal Autonomous Weapons Systems, 11–15 April 2016, Geneva) (2016) https://www.icrc.org/sites/default/files/document/file_list/ccw-autonomous-weapons-icrc-april-2016.pdf

[13] Heyns C, 'Autonomous Weapons Systems: Living a Dignified Life and Dying a Dignified Death' (2016) In N. Bhuta, S. Beck, R. Geiβ, H.-Y. Liu, & C. Kreβ (Eds.), Autonomous Weapons Systems: Law, Ethics, Policy, 3-20, p. 6

[14] ICRC, 'Views of the ICRC on Autonomous Weapon Systems' (n. 12)

understand the extent to which human involvement influences how decisions concerning distinction, proportionality, and precautions in attack are made, and more importantly, how it affects the attribution of responsibility for unlawful harm.

To understand how autonomy operates in practice, it is necessary to consider the so-called targeting cycle (commonly defined as the "kill chain"), through which military force is applied. In conventional operations, this process typically involves a sequence of stages: the detection of potential targets, their identification and verification, the selection of a lawful objective, the decision to engage, the execution of the attack, and the assessment of its effects. Traditionally, human operators have performed or contributed to each of these stages, particularly in determining whether a target qualifies as a lawful military objective and whether an attack complies with the principles of international humanitarian law.[15] However, autonomous weapons systems may automate some or all of these functions. The degree to which the system independently performs tasks within this cycle is what ultimately determines the level of autonomy and the corresponding reduction or transformation of direct human involvement.

Depending on the level of human involvement, different types of AWS can be identified:

- Semi-autonomous systems - human in the loop: the system can select targets and deliver force only when a human operator gives the input.[16] Currently there are a lot of examples of this kind of system being employed. For instance, Iron Dome is a system used by Israel to intercept and identify the point of impact of rockets and artillery shells, then it sends this data to a human soldier who determines whether to launch an interceptor rocket.[17]
- Supervised autonomous systems - human on the loop: the system does not require real-time and constant human involvement. The program can select targets and deliver force under the supervision of a human operator who can overturn the system's actions. An example is SGR-A1, a sentry robot used in South Korea in the demilitarized zone on the border with North Korea. This robot detects intruders and issues a verbal warning. If this is ignored, the robot is equipped with a machine gun, which can be fired remotely by a human soldier or by the robot itself if it is in fully automatic mode.[18]

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[15] Jessica Dorsey, 'The Erosion of Human(E) Judgement in Targeting? Quantification Logics, AI-Enabled Decision Support Systems and Proportionality Assessments in IHL' [2026] International Review of the Red Cross 1-31, p. 13-14
https://www.cambridge.org/core/journals/international-review-of-the-red-cross/article/erosion-of-humane-judgement-in-targeting-quantification-logics-aienabled-decision-support-systems-and-proportionality-assessments-in-ihl/31024C3473211FB84FD535BC815ADC03

[16] Maria Gevorgyan, 'Crossing Boundaries: Autonomous Weapon Systems and the Challenge of IHL Compliance' (2023) 2023 Int'l J L Ethics Tech 21, p. 27

[17] Yiftah S. Shapir, 'Lessons from the Iron Dome' (2013) 5 Military and Strategic Affairs, p. 81
https://www.inss.org.il/wp-content/uploads/sites/2/systemfiles/MASA5-1Eng4_Shapir.pdf

[18] Han-Kyun Kim, 'Sentry Robots in Action: Ethical and Legal Issues of Automated Weapon in South Korea' [2022] CLAWAR Association Ltd., p. 41
https://www.clawar.org/icres2022/wp-content/uploads/2022/07/ICRES2022_paper_8.pdf

- Fully autonomous systems - human out of the loop: these are the most advanced AWS. In this case, the system is programmed in a way that is capable of selecting targets and delivering force without any human assistance at any stage of the process.[19] For instance, the IAI Harpy is a loitering munition (expendable uncrewed aircraft) capable of applying force through sensor-based targeting without human intervention after activation.[20]

It is important to highlight that these categories, while analytically useful, should not be understood as rigid classifications. In fact, systems may operate with different levels of autonomy depending on mission parameters, environmental conditions, and operational constraints. Moreover, human involvement may occur at earlier stages of the process, such as programming and deployment decisions, even where real-time supervision is limited.

1.1.2 Lethal autonomous weapons and the scope of analysis

As previously noted, the notion AWS encompasses a broad range of technologies, which can raise different legal concerns. Some operate in highly constrained and defensive contexts, while others function as decision-support tools without independently applying force. Therefore, it is necessary to distinguish systems that merely assist human operators from those that meaningfully displace human judgment in the deployment of force.

For the purposes of this analysis, the focus is restricted to lethal autonomous weapons systems (LAWS). These kinds of weapons are the most advanced version that, through sensor suites and computer algorithms, are capable of identifying, engaging, and destroying a target without human control.[21] These functions can be further enabled by artificial intelligence (AI); nevertheless, AI is not a necessary component for the functioning of these systems. Autonomous powers can be provided through predefined tasks based on tailored parameters or through AI tools, which can derive behavior from data, thus allowing the system to make independent decisions based on their knowledge.[22]

Considering that many countries have reportedly deployed weapons with autonomous features (among others, Russia, Israel, and South Korea) and others are heavily investing in the development of LAWS (such as the US, the UK, and China), the legal implications of lethal

[19] Amitai Etzioni, 'Pros and Cons of Autonomous Weapons Systems (with Oren Etzioni)' (2018) 11 Library of Public Policy and Public Administration, Springer 253-263, p. 260-261 https://link.springer.com/chapter/10.1007%2F978-3-319-69623-2_16

[20] Ingvild Bode and Thomas Frank Arthus Watts, 'Loitering Munitions and Unpredictability Autonomy in Weapon Systems and Challenges to Human Control' (2023) https://findresearcher.sdu.dk/ws/portalfiles/portal/231643063/Loitering_Munitions_Unpredictability_WEB.pdf

[21] Kelley Sayler, 'Defense Primer: U.S. Policy on Lethal Autonomous Weapon Systems' (2023), Congressional Research Service, p. 1

[22] United Nations Office for Disarmament Affairs, 'Lethal Autonomous Weapon Systems' (Unoda.org 2025) https://disarmament.unoda.org/en/our-work/emerging-challenges/lethal-autonomous-weapon-systems

autonomy are no longer merely hypothetical. The development and subsequent deployment of LAWS has led to a series of moral and legal questions.[23]

These issues are addressed by the UN Group of Governmental Experts (GGE) on LAWS, established under the Convention on Certain Conventional Weapons (CCW).[24] Since 2014, the GGE discusses the challenges posed by LAWS to the compliance with IHL, the issue of autonomy and human control in the employment of lethal force, and tries to find a common definition for these systems. However, despite years of activity, the group has failed to reach a consensus on a binding legal framework due to differing national interests and geopolitical disagreements.[25]

1.2 Autonomous weapons systems in contemporary military practice

The integration of autonomous weapons, and more specifically of AI, in the battlefield is revolutionizing modern warfare. These systems have opened a debate among military strategists, robot engineers, and ethical experts about the development and deployment of weapons that function without human oversight. Advocates of AWS argue that these systems offer greater military advantages in the battlefield; moreover, they are preferable to the recruitment of human soldiers. On the other hand, critics maintain that these weapons must be limited or banned for different legal and moral reasons.[26]

1.2.1 Claimed operational advantages and military necessity

Proponents of AWS highlight the great benefits that can be brought to the battlefield by investing in the development and deployment of these systems. At the center there is the core conception of military necessity that "permits measures which are actually necessary to accomplish a legitimate military purpose and are not otherwise prohibited by international humanitarian law. In the case of an armed conflict, the only legitimate military purpose is to weaken the military capacity of the other parties to the conflict".[27]

As described by the US Department of Defense, unmanned systems act as force multipliers capable of performing tasks that would normally require more soldiers under conventional

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[23] Lee (n. 8)
[24] Digital Watch Observatory, 'GGE on lethal autonomous weapons systems' (Geneva Internet Platform, undated) https://dig.watch/processes/gge-laws
[25] Williams and Scharre (n. 9) 117
[26] Etzioni (n. 19) 253
[27] ICRC, 'Military Necessity | How Does Law Protect in War? - Online Casebook' (casebook.icrc.org) https://casebook.icrc.org/a_to_z/glossary/military-necessity. This notion will be further explored in the next chapter of this thesis.

circumstances. Moreover, they cover larger areas in the battlefield and can reduce military casualties by removing human soldiers from dangerous territories.[28]

Furthermore, as described in the "Unmanned Systems Roadmap 2007-2032" published by the Pentagon, these systems are better suited for "dull, dirty, or dangerous" missions. In this document, it is explained that the use of autonomous systems is preferable compared to the use of human soldiers: for the "dull missions" allowing soldiers to have normal daily cycles and rest; for the "dirty missions" these programs increase the possibility of a successful mission while minimizing human exposure; and for the "dangerous missions" they lower the political and human cost if an operation is lost.[29]

Promoters argue that AWS can be beneficial from an economic point of view; it has been shown that maintaining human soldiers is more costly than an armed robot. This could bring long-term savings to states' military powers.[30] Additionally, robots do not feel physical and mental strains as humans do; therefore, they can not be fatigued and distorted by physiological and mental constraints. This leads to more precise and consistent performance on the battlefield, potentially reducing casualties and errors. Finally, roboticist Ronald Arkin argues that autonomous systems can act more "humanely" than human soldiers since he defines human behavior in the battlefield as "questionable at best". He asserts that AWS can be programmed to not act clouded by emotions and are able to process much more information and respond accordingly faster than a human soldier.[31]

1.2.2 Risks and concerns arising from autonomous decision-making

In the last decade, there have been numerous calls from civil society and international bodies advocating for restrictions and/or a ban on autonomous weapons. In 2013, Christof Heyns (UN Special Rapporteur on extrajudicial, summary or arbitrary executions) was the first to voice concern about LAWS in a report presented to the Human Rights Council.[32]
In the same year, a group of engineers, robotics and AI experts, and researchers from 37 countries called for a ban on the development and deployment of AWS, arguing that "decisions about the application of force must not be delegated to machines".[33]

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[28] Gary E Marchant, Braden Allenby, Ronald Arkin, Edward T Barrett, Jason Borenstein, Lyn M Gaudet, Orde Kittrie, Patrick Lin, George R Lucas, Richard O'Meara and Jared Silberman, 'International Governance of Autonomous Military Robots' (2011) *Columbia Science and Technology Law Review* XII 272
[29] US Department of Defense, *Unmanned Systems Roadmap: 2007–2032,* (2007) Government Publishing Office, p. 19 https://www.govinfo.gov/content/pkg/GOVPUB-D-PURL-LPS91893/pdf/GOVPUB-D-PURL-LPS91893.pdf
[30] Etzioni (n. 19) 254
[31] Ronald Arkin, ' The Case for Ethical Autonomy in Unmanned Systems' (2010) Journal of Military Ethics 9(4), 332-341 https://repository.gatech.edu/server/api/core/bitstreams/62b98c87-e7af-4b1c-80a3-6b5157be079e/content
[32] Christof Heyns, Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, A/HRC/23/47' (2013) UN Human Rights Council
[33] ICRAC (International Committee for Robot Arms Control), 'Scientists' Call for Ban on Autonomous Lethal Robots' (2013) http://icrac.net/wp-content/uploads/2018/06/Scientist-Call_Press-Release.pdf

In fact, the transfer of life-or-death decision-making to machines is one of the biggest concerns. There is a risk in dehumanizing people by allowing machines to decide whether or not to attack, this can be considered a "death by algorithm" according to which people are treated simply as targets and not as complete human beings. Critics point out that AWS lack the moral agency and contextual judgment traditionally associated with human decision-making in life-ending situations.[34] It has also been argued that machines are inherently unable to distinguish between soldiers and civilians and between combatants and those *hors de combat*[35], this constitutes a violation of the principle of distinction, a fundamental notion of the law of armed conflict.[36]

Another major concern is the issue of accountability. A fundamental tenet of IHL is that responsibility must be attributed to an individual in case of civilian harm or unlawful killing. However, LAWS complicate this assumption because algorithmic systems may produce outcomes that no individual intended or foresaw, making it problematic to establish accountability. In traditional contexts where a human makes the decision to use force, a traceable chain of accountability can be established. Under the current international legal framework, only people can be held accountable; this becomes problematic when a machine is capable of independently taking action.[37]

Moreover, there is the problem of the "black box", which refers to the lack of transparency in AI systems; thus, it becomes impossible to really know why or how decisions are taken. This opacity poses serious challenges for victims and their families, who may not be able to receive a clear explanation of the events, and without an identifiable actor to be held responsible, they cannot receive justice. Opponents argue for the need to ensure that these systems are sufficiently explainable and prohibit those that cannot be used with MHC.[38]

Finally, the progressive development of these kinds of weapons increases the risk of an emerging arms race. Major military powers are heavily investing in these technologies invoking political tensions and security concerns as justification. This causes tension on the international level, increasing the risk of new conflicts. Additionally, these systems contribute to the further detachment of humans from the direct use of force, raising concerns about the normalization and lowering the threshold of military intervention.[39] Indeed, states have used armed drones to strike

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[34] Heyns C, 'Autonomous Weapons Systems: Living a Dignified Life and Dying a Dignified Death' (2016) In N. Bhuta, S. Beck, R. Geiβ, H.-Y. Liu, & C. Kreβ (Eds.), Autonomous Weapons Systems: Law, Ethics, Policy, 3-20, p. 11

[35] ICRC, 'Hors de Combat | How Does Law Protect in War? - Online Casebook' (casebook.icrc.org) https://casebook.icrc.org/a_to_z/glossary/hors-de-combat

[36] Crawford and Pert (n. 5) 276

[37] Etzioni (n. 19)

[38] Stop Killer Robots, 'Problems with Autonomous Weapons' (Stop Killer Robots 2021) https://www.stopkillerrobots.org/stop-killer-robots/facts-about-autonomous-weapons/
The notion of Meaningful Human Control will be further explained in Chapter 4.

[39] UN GA First Committee, 'Lethal Autonomous Weapons Systems' (Draft Resolution A/C.1/79/L.77, 2024) https://documents.un.org/doc/undoc/ltd/n24/305/45/pdf/n2430545.pdf

in situations where they would not have before, causing fear and bringing conflicts to areas detached from active fighting zones.[40]

1.3 Autonomous weapons as a legal challenge

The risks deriving from autonomous decision-making outlined above do not only raise ethical and policy questions; in fact, they reveal deeper structural tensions within the existing legal framework governing the use of force. Both IHL and IHRL revolve around the premise that human agents exercise judgment in determining the conditions of the application of force. Indeed, legal responsibility is traditionally centered around identifiable human decision-makers. The delegation of these functions to algorithmic systems, therefore, raises questions regarding how existing legal norms are to be interpreted, applied, and enforced in practice.[41]

1.3.1 The shift from human judgment to algorithmic processes

The shift from human judgment to algorithmic processes constitutes a qualitative and paradigmatic change that fundamentally alters the nature of warfare and legal responsibility.[42] Rather than a simple quantitative adjustment to new military tools, this transition moves core functions of warfare from human-centered agency to AI decision-making.

Historically, the use of force has been an "intensely personal affair" requiring a human to be physically present at the point in time when force is released. The intervention of AI in warfare creates a depersonalization in the use of force, where humans are not only physically absent from the battlefield but also psychologically absent.[43] This leads to what can be referred to as "numbed killing" or the "PlayStation effect", according to which the physical distance created by technology decreases the awareness that the end product of an algorithm is a dead human being.[44]

Moreover, human judgment relies on context-dependent elements such as compassion, empathy, and common sense.[45] Algorithms require these subjective values to be translated into explicit numeric variables that a machine can process in order to perform an action. For instance, the

[40] Stop Killer Robots, 'Problems with Autonomous Weapons' (n. 38)
[41] Thomas Weigend, 'Convicting Autonomous Weapons?' (2023) 21 *Journal of International Criminal Justice* 1137–1154
[42] Robin Geiss and Henning Lahmann, 'Autonomous Weapons Systems: A Paradigm Shift for the Law of Armed Conflict? (2017) in J.D. Ohlin (ed.), Research Handbook on Remote Warfare (Edward Elgar Publishing, 2019), 371–404
[43] Christof Heyns, 'Autonomous weapons systems: living a dignified life and dying a dignified death' (2016) in Bhuta N, Beck S, Geiβ R, Liu H-Y, Kreβ C, eds. *Autonomous Weapons Systems: Law, Ethics, and Policy*. Cambridge University Press; 3-20
[44] Arkin (n. 31) 6
[45] Lee (n. 8)

principle of proportionality (weighing military necessity and civilian harm) must be reduced to mathematical calculations and objectives to be implemented by an algorithm.[46]

This shift towards an algorithmic logic is characterized by autonomous processes, which are often non-deterministic and probabilistic. This means that since they can learn and adapt to their environment, their actions may be unpredictable.[47] This relates to the "black box problem" and the consequent issue of reduced perceivability where humans cannot fully understand the internal rationale leading to a machine's decision; therefore, the issue of ascribing responsibility to humans becomes increasingly complex.[48]

Moreover, the human role in warfare transitions from direct participation and control to supervisory control or complete delegation. Humans move from being "in the loop" to "on the loop" or "out of the loop", completely delegating the entire process of decision-making to an algorithm.[49] Additionally, this shift may eventually redefine certain military professions. For instance, aircraft pilots may become "system managers" whose primary task would be monitoring algorithmic performance rather than executing firsthand combat functions.[50]

Finally, this transition from human judgment to algorithmic processes also puts into question the attribution of responsibility, creating significant challenges for the international legal framework. A growing consensus on placing moral responsibility for the actions of AWS on humans has grown. Indeed, the UN Group of Governmental Experts puts human responsibility at the center in case of the deployment of LAWS: "Human responsibility for decisions on the use of weapons systems must be retained since accountability cannot be transferred to machines. This should be considered across the entire lifecycle of the weapon system".[51] However, ascribing responsibility to human agents in practice has proven to be problematic. When unlawful lethal outcomes result from the deployment of an autonomous weapon, identifying the relevant human decision-maker becomes significantly more complex. The diffusion of roles among programmers, manufacturers,

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[46] Tom Keeley, 'Auditable Policies for Autonomous Systems (Decisional Forensics)' in Andrew P. Williams and Paul D. Scharre (eds.), *Autonomous Systems: Issues for Defence Policymakers* (Headquarters Supreme Allied Commander Transformation 2015) 196-225, pp. 200-201

[47] Andrew P. Williams, 'Defining Autonomy in Systems: Challenges and Solutions' in Andrew P. Williams and Paul D. Scharre (eds.), *Autonomous Systems: Issues for Defence Policymakers* (Headquarters Supreme Allied Commander Transformation 2015), 27, p. 38

[48] Jonathan Kwik, 'The Conceptual Roots of the Criminal Responsibility Gap in Autonomous Weapon Systems' (2023) 24(1) *Melbourne Journal of International Law* 1, p. 10

[49] Etzioni (n. 19) 260

[50] Albert Husniaux, 'Afterword: Looking Forward – A Research Agenda for NATO' in Andrew P. Williams and Paul D. Scharre (eds.), *Autonomous Systems: Issues for Defence Policymakers* (Headquarters Supreme Allied Commander Transformation 2015) 318, p. 320

[51] Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, '*Report of the 2019 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems*' (Convention on Certain Conventional Weapons, UN Doc CCW/GGE.1/2019/3, 2019), para. 21

army commanders, and operators complicates the reconstruction of a clear chain of responsibility within the current legal framework.[52]

1.3.2 Implications for the regulation of the use of force

The growing integration of autonomous functions into weapons systems carries significant implications for the regulation of the use of force, primarily by challenging the effectiveness of existing international legal standards and creating the necessity for new frameworks establishing accountability. The existing law of armed conflict was largely developed on the assumption of human actors exercising judgment when identifying targets and deciding on whether to attack, applying lethal force. The delegation of these functions to algorithmic systems raises questions as to whether traditional legal standards can be applied and enforced in the same manner when governing conventional military operations. It must be highlighted that IHL does not generally prohibit specific weapons solely on the basis of their technological characteristics; therefore, AWS are not per se unlawful. However, like every kind of weapon, AWS must be subjected to the applicable legal rules governing the conduct of hostilities.[53]

Article 36 of the Additional Protocol I to the Geneva Conventions requires states to conduct legal reviews of all new weapons, means, and methods of warfare to establish whether their use is allowed or prohibited by international law. It recites: "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".[54] This obligation applies equally to AWS; however, due to their technological advancements, the process of conducting legal review becomes more complicated.[55] The ability to conduct such reviews entails fully understanding the weapon's capabilities and foreseeing its effects. However, predicting outcomes may be increasingly difficult since AWS are becoming more and more technologically complex, and their effects may be less predictable due to their self-learning capabilities and consequent freedom of action.[56]

These practical difficulties generated broader discussions regarding whether existing regulatory mechanisms are sufficient to address the challenges brought by AWS. In recent years, debates have intensified within international forums, particularly under the framework of the Convention on Certain Conventional Weapons, where states and experts have explored possible regulatory

[52] Crawford and Pert (n. 5) 278
[53] Noone and Noone (n. 3) 29
[54] Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Additional Protocol I) (adopted 8 June 1977, entered into force 7 December 1978) 1125 UNTS 3, art. 36
[55] Vincent Boulanin, 'Implementing Article 36 Weapon Reviews in the Light of Increasing Autonomy in Weapon Systems' (SIPRI Insights on Peace and Security No 2015/1, Stockholm International Peace Research Institute, November 2015), p. 2 http://sipri.org/sites/default/files/files/insight/SIPRIInsight1501.pd
[56] Views of the ICRC on Autonomous Weapon Systems (n. 12) 4

responses to emerging autonomous technologies. Currently no binding treaty specifically addressing AWS has been adopted yet; however, a number of non-binding instruments and policy proposals have been advanced.[57] For instance, the GGE on LAWS adopted a set of guiding principles in 2019 highlighting that "International humanitarian law continues to apply fully to all weapons systems, including the potential development and use of lethal autonomous weapons systems" and "Human responsibility for decisions on the use of weapons systems must be retained since accountability cannot be transferred to machines. This should be considered across the entire life cycle of the weapons system".[58]

Moreover, various scholars, international organizations, and other actors promote the concept that a sufficient level of human involvement must be maintained in decisions concerning the use of force; this is commonly referred to as meaningful human control. Although the precise notion and legal status of this principle remain contested, it has increasingly been presented as a potential safeguard (as it will be illustrated in Chapter 4 of this thesis).[59] These initiatives show the ongoing efforts within the international community to address the legal and ethical challenges raised by AWS.

[57] Marchant et al (n. 28) 29
[58] Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, *Report of the 2019 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems* (Convention on Certain Conventional Weapons, UN Doc CCW/GGE.1/2019/3, 25 September 2019) https://documents.unoda.org/wp-content/uploads/2020/09/CCW_GGE.1_2019_3_E.pdf
[59] Views of the ICRC on Autonomous Weapon Systems (n. 12) 5

CHAPTER 2 - APPLICABLE LEGAL FRAMEWORK UNDER INTERNATIONAL HUMANITARIAN LAW AND INTERNATIONAL HUMAN RIGHTS LAW

2.1 International Humanitarian Law governing AWS

International humanitarian law (IHL), also known as the law in war (*jus in bello*) or the law of armed conflict (LOAC), is a branch of international law. This collection of rules seeks to limit the effects of armed conflict for humanitarian reasons. It protects persons who do not or no longer participate in active hostilities and restricts means and methods of warfare. It does not regulate whether a state may actually use force; instead, it focuses on regulating how that force is used.[60] IHL governs the conduct of states and non-state actors in international and non-international armed conflicts. This body of law seeks to balance the needs of a state's armed forces (or non-state group) to proceed with the armed conflict and the humanitarian need to protect people who do not, or no longer (*hors de combat*), participate in the hostilities.

IHL is primarily found in treaties and customary law; a major part of it can be found in the Hague Conventions (1899 and 1907) and the four Geneva Conventions of 1949 and the Additional Protocols of 1977 on the protection of victims of armed conflict.[61]

IHL is structured around finding a balance between military necessity and the principle of humanity. According to Article 35.1 of Additional Protocol I, "In any armed conflict, the right of the parties to the conflict to choose methods or means of warfare is not unlimited".

The principle of military necessity is mentioned multiple times in the Geneva Conventions; however, it is not explicitly defined.[62] Despite the absence of a clear definition, this fundamental tenet requires that a party to an armed conflict may only resort to force if it is necessary to achieve the legitimate purpose of a conflict, which is to "weaken the military forces of the enemy".[63] Therefore, it permits "regulated violence", which is violence directed at incapacitating the enemy, but its effect must not be disproportionate to the suffering that it entails. Thus, measures that would be otherwise prohibited under IHL are not allowed in the name of military necessity.[64] A rule of IHL may be derogated on grounds of military necessity only when such a

[60] International Committee of the Red Cross, *What is International Humanitarian Law?*. (ICRC Factsheet, July 2004) https://www.icrc.org/sites/default/files/document/file_list/what-is-ihl-factsheet.pdf
[61] Crawford and Pert (n. 5) 29-30
[62] Gargi Santra, 'International Humanitarian Law: A Balance between Military Necessity and Humanity' (2021) 4 Int'l JL Mgmt & Human 2914, p. 2917
[63] Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight (1868), preamble
[64] International Committee of the Red Cross, *The Principles of Humanity and Necessity* (ICRC, March 2023) https://www.icrc.org/sites/default/files/wysiwyg/war-and-law/02_humanity_and_necessity-0.pdf

rule permits such a derogation.[65] Military necessity should not be understood as a limit on military operations; rather, this concept acknowledges the legitimacy of taking military considerations into account when shaping the rules of warfare.[66]

On the other hand, the principle of humanity finds its expression in a range of IHL norms and serves as a central principle of constraints on actions motivated by military necessity. It requires that all individuals should be treated humanely at all times, even combatants who have been captured by their enemies. This principle applies to both prisoners of war and civilians. Its purpose is to limit the harm, death, and destruction, which are elements considered to be necessary during armed conflicts. Same as with military necessity, humanity can not be used to deviate from an IHL obligation.[67] Following this principle, Additional Protocol I provides for a general protection that covers cases not addressed by codified international law. According to Article 1.2: "In cases not covered by this Protocol or by other international agreements, civilians and combatants remain under the protection and authority of the principles of international law derived from established custom, from the principles of humanity and from the dictates of public conscience".[68]

From these two pillars derive other fundamental principles of IHL. In the following sections, the principles of distinction, proportionality, and precaution will be analyzed taking the specific challenges posed by AWS into account.

2.1.1 The principle of distinction

The principle of distinction asserts that "the parties to the conflict must at all times distinguish between civilians and combatants. Attacks may only be directed against combatants. Attacks must not be directed against civilians".[69] This rule applies also to objectives: "The parties to the conflict must at all times distinguish between civilian objects and military objectives. Attacks may only be directed against military objectives. Attacks must not be directed against civilian objects".[70]

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[65] Médecins Sans Frontières, *Military Necessity* (The Practical Guide to Humanitarian Law, undated) https://guide-humanitarian-law.org/content/article/3/military-necessity/

[66] Michael N. Schmitt, Military Necessity and Humanity in International Humanitarian Law: Preserving the Delicate Balance' (2010) 50(4) *Virginia Journal of International Law*, p. 799

[67] Santra (n. 62) 2919

[68] Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Additional Protocol I) (adopted 8 June 1977, entered into force 7 December 1978) 1125 UNTS 3, art. 1(2)

[69] International Committee of the Red Cross, *Rule 1. The Principle of Distinction between Civilians and Combatants* (Customary IHL Database) https://ihl-databases.icrc.org/en/customary-ihl/v1/rule1 See also AP I Art. 48.

[70] Ibid. See also AP I Art. 52(2).

According to this principle, attacks must not be directed against civilians and combatants who are *hors de combat* (including wounded, sick or surrendering).[71] The classification of persons during an armed conflict requires highly contextual legal assessments depending on status, causality, intent, and conduct. In cases of doubt, a person should be considered a civilian.[72] The operation of determination is complex for humans, as it requires contextual and qualitative assessments that are difficult to convert into mathematical values that can be used by AWS in targeting operations. AWS are configured to distinguish between combatants and non-combatants; in fact, a system designed to be employed in a restricted area (such as the high seas or an evacuated hostile area) would not per se violate this principle. The issue arises in complicated contexts and cluttered environments where it is difficult for a machine to accurately differentiate between combatants and civilians.[73] In these volatile settings, the status of a person may change rapidly, from being a lawful target to *hors de combat*. Indeed, it is in those scenarios that machine judgment is not at the same level as humans; this can create risks of IHL violations.[74]

The principle of distinction applies equally to objects. Parties to a conflict are required to distinguish at all times between civilian objects and military objectives, directing attacks exclusively against the latter. Civilian objects are protected from attack unless and for such time as they are used for military operations, contributing to military action; therefore, their destruction offers a definitive military advantage for the enemy's army.[75] Like the classification of persons, the determination for objects is highly contextual and may change depending on the circumstances. The application of this principle poses particular challenges for AWS since it is difficult for users to ensure, at the moment of activation, that any object targeted will meet the required legal criteria.[76] This is particularly problematic for dual-use objects, those objects that serve both a civilian and military function, such as bridges, power grids, or communication systems. Consequently, their destruction for military necessity constitutes the destruction of the civilian element. This term is not used in IHL treaties and there is no fixed category; therefore,

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[71] International Committee of the Red Cross, *Customary International Humanitarian Law*, Rule 6 and Rule 47; Additional Protocol I, arts 41(1), 51(3), and 85(3)(e); Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of Non-International Armed Conflicts (Additional Protocol II) (adopted 8 June 1977, entered into force 7 December 1978) 1125 UNTS 609, art 13(3); Geneva Conventions of 12 August 1949, common art 3.

[72] Additional Protocol I, Article 50(1)

[73] Muhammad Ihsan Mashadi, 'The Impact of Autonomous Weapon Systems on Civilian Protection: A Legal Analysis under International Humanitarian Law' (2025), p. 12 https://www.researchgate.net/publication/393149777_The_Impact_of_Autonomous_Weapon_Systems_on_Civilian_Protection_A_Legal_Analysis_under_International_Humanitarian_Law

[74] Elliot Winter, 'The Compatibility of Autonomous Weapons with the Principles of International Humanitarian Law' (2022) 27(1) *Journal of Conflict and Security Law* 1, p. 14 https://academic.oup.com/jcsl/article/27/1/1/6513626

[75] ICRC, Customary IHL Study, Rule 7; AP I, Art. 52(2).

[76] International Committee of the Red Cross, *Autonomous Weapon Systems and International Humanitarian Law: Selected Issues* (ICRC, March 2026), p. 13-14 https://www.icrc.org/sites/default/files/202603/4896_002_Autonomous_Weapons_Systems_-_IHL-ICRC.pdf

their function must be strictly assessed based on the conditions present at the time of targeting and attacking.[77] The use of AWS is particularly risky with these kinds of infrastructures due to their rapidly changing characterizations which an algorithm may not detect. Thus, the deployment of such systems could increase the risk of unlawful attacks on civilian objects.

Stemming from the principle of distinction, the prohibition against indiscriminate attacks requires that parties to a conflict direct their operations solely against military objectives. Article 51 of AP I defines indiscriminate attacks as "(a) those which are not directed at a specific military objective; (b) those which employ a method or means of combat which cannot be directed at a specific military objective; or (c) those which employ a method or means of combat the effects of which cannot be limited as required by this Protocol; and consequently, in each such case, are of a nature to strike military objectives and civilians or civilian objects without distinction".[78] Therefore, those deploying AWS must ensure that their use does not amount to indiscriminate attacks. This involves evaluating the consequences of any strike occurring after activation and considering all reasonably foreseeable developments. However, this operation is problematic since the effects of AWS may be difficult to predict, particularly when their decision-making processes are opaque or not fully explainable.[79]

2.1.2 The principle of proportionality

The doctrine of proportionality prohibits military operations whose anticipated incidental loss of civilian life, injury to civilians, or civilian property damage would be "excessive in relation to the concrete and direct military advantage anticipated".[80] The prohibition of disproportionate attacks requires a prospective (*ex-ante*) assessment based on the circumstances prevailing at the time of planning an attack, balancing potential incidental harm to civilians and civilian objects with the anticipated direct military advantage.[81]

An autonomous weapon should be able to comply with the principle of proportionality; however, critics argue that proportionality requires a context-specific, values-based human judgment that cannot be reduced to a mathematical formula or coded into an algorithm.[82]
Moreover, a significant challenge is the gap between a human's initial assessment at the time of activation and the eventual strike. Since the human user cannot know exactly who or what will be struck, or when and where the force will be applied, the military advantage may fade or civilian presence may increase after activation, rendering the initial proportionality assessment invalid.[83]

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[77] Crawford and Pert (n. 5) 221-222
[78] Additional Protocol I, Article 51(4)
[79] ICRC, Autonomous Weapon Systems and IHL (n 76) 15
[80] Additional Protocol I, Article 51(5)(b). ICRC, Customary IHL Study, Rule 14.
[81] ICRC, Autonomous Weapon Systems and IHL (n 76) 15
[82] Winter (n. 74) 15-17
[83] Mashadi (n. 73) 14

This concern is particularly acute in the case of fully autonomous systems operating without human intervention ("out of the loop"), where no subsequent assessment is made at the moment of attack. However, it may also arise, albeit to a lesser extent, in systems with limited human supervision ("on the loop"), where the capacity for timely and meaningful intervention is constrained.

2.1.3 The principle of precaution

The principle of precaution in IHL mandates that parties to a conflict take "constant care […] to spare the civilian population, civilians and civilian objects".[84] This obligation encompasses the adoption of several precautions, including verifying that targets are military objectives, choosing means and methods that minimize incidental harm, providing effective advance warnings when possible, and canceling or suspending attacks if it becomes apparent they would be disproportionate or misdirected.[85] Adherence to the obligation to take precautions in attacks places significant operational demands on AWS.

While technical features such as self-deactivation mechanisms or sensors may help reduce risks, they do not per se fulfill the requirement to take all feasible precautions. The use of AWS cannot justify the omission of taking precautionary measures that would otherwise be feasible in similar circumstances, for instance, using alternative means or methods of warfare. The application of this principle is particularly problematic when the employment of AWS limits direct human control, for instance, by preventing real-time intervention or by constraining effective advance warning, therefore putting at risk the civilian population. In those cases, if other weapons or methods would allow for greater protection of civilians, the obligation to take precaution may require their use instead. Finally, initial assessments may be deemed inadequate due to sudden changes in the warzone after activation; this is particularly accurate in dynamic or crowded areas, thus the use of AWS may increase the risk of civilian harm.[86]

2.2 International Human Rights Law applicable during armed conflict

Deriving from public international law, International Human Rights Law (IHRL) is a distinct set of international norms, rules, and standards dealing with the protection of individuals. Human rights are rights attributed to individuals simply because they are human beings: moreover, these rights are not granted by a state.[87] In fact, they are inherent to every individual, regardless of race, color, sex, language, religion, political or other opinion, national or social origin, property,

[84] Additional Protocol I, Article 57(1)
[85] Additional Protocol I, Article 57. ICRC, Customary IHL Study, Rules 15-21
[86] ICRC, Autonomous Weapon Systems and IHL (n 76) 17
[87] Office of the United Nations High Commissioner for Human Rights, *What are Human Rights?* (OHCHR) https://www.ohchr.org/en/what-are-human-rights

birth, or other status.[88] IHRL sets obligations for states, which are called to respect, protect, and fulfill the human rights of any individual, regardless of their citizenship.[89]

Unlike IHL, IHRL is applied at all times, both during peacetime and armed conflict. Certain rights can be derogated from "in time of public emergency".[90] Nevertheless, human rights treaties, such as established by article 4(2) ICCPR[91], provide for a list of non-derogable rights, which are those rights that can never be restricted, even in times of emergency. These lists may slightly vary depending on the treaty but they always encompass absolute rights (such as the prohibition of torture). However, not all non-derogable rights are absolute; indeed, some rights can be restricted under certain circumstances. That said, such restrictions are governed by strict safeguards that must be consistently upheld. An example is the right to life.[92]

2.2.1 The right to life and its substantive and procedural dimensions

The right to life is protected and recognized in all major international and regional human rights instruments. Article 6(1) of the ICCPR states that: "Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life".[93] This right imposes both positive and negative obligations on states; they must take appropriate measures to protect the lives of every individual within their jurisdiction and, at the same time, refrain from the arbitrary deprivation of life.

The central tenet governing the use of lethal force under IHRL is the prohibition of arbitrary deprivation of life. The right to life has been referred to as a fundamental right; however, it is not absolute since international and regional treaties permit the use of force resulting in the deprivation of life when it is not arbitrary. Necessity, proportionality, and legality are elements which guard against arbitrariness. Therefore, state agents may use lethal force when it is regulated by law, when it is necessary, and there are no less harmful means available or when lethal force is not disproportionate to the intended aim.[94] It must be highlighted that the use of lethal force is considered a measure of last resort since the preservation of life continues to be the primary objective.

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[88] Universal Declaration of Human Rights (adopted 10 December 1948 UNGA Res 217 A(III)), Art. 2
[89] Office of the United Nations High Commissioner for Human Rights, *International Human Rights Law* (OHCHR) https://www.ohchr.org/en/instruments-and-mechanisms/international-human-rights-law
[90] International Covenant on Civil and Political Rights (adopted 16 December 1966, entered into force 23 March 1976), 999 UNTS 171, art. 4(1)
[91] ICCPR, art. 4(2)
[92] Olivier De Schutter, 'Derogations in Time of Public Emergency' in Daniel Moeckli, Sangeeta Shah and Sandesh Sivakumaran (eds), *International Human Rights Law* (2nd edn, Cambridge University Press 2019) 607–654, pp. 648-649
[93] ICCPR art. 6(1)
[94] Ilias Bantekas and Lutz Oette, *International Human Rights Law and Practice* (4th edn, Cambridge University Press 2024), pp. 365-366

The right to life also entails procedural obligations for states. Whenever a death occurs at the hands of the state or where there is a credible allegation that a state failed in its protective duty, the state is required to conduct an effective, independent, and impartial investigation.[95] Investigations are necessary to ensure accountability by identifying and punishing those responsible and to provide the family of the victim justice. Without this procedural safeguard, the prohibition against arbitrary killing would be unenforceable, leading to impunity.[96]

In the Nuclear Weapons Advisory Opinion[97], the International Court of Justice established that the prohibition against the arbitrary deprivation of life remains valid during hostilities; however, the criteria to establish the "arbitrariness" are governed by IHL (considered *lex specialis*).[98] Consequently, the lawfulness of a casualty in conflict, under article 6 ICCPR, is not deduced from human rights norms alone, but it is contingent upon whether the act complied with the laws of armed conflict.[99]

These considerations raise particular challenges in the context of emerging technologies such as autonomous weapons systems, where the delegation of life-and-death decisions to machines may complicate the assessment of necessity, proportionality, and accountability under IHRL.

2.2.2 Extraterritorial application of IHRL in armed conflict

The issue of understanding and establishing extraterritoriality becomes relevant when AWS are deployed across borders without direct physical presence on the ground. This raises complex questions as to whether and when individuals affected fall within the jurisdiction of the deploying state.

State conduct has an impact on the enjoyment of human rights not only on those people within a state's sovereign territory; in fact, it may exercise extraterritorial impact on people outside their borders. For instance, in the case of civil and political rights, extraterritorial activity applies to the conduct of warfare, occupation, sanction regimes, and other military actions, such as strikes by drones. However, the extent to which extraterritoriality of human rights obligations applies is debated. The legal landscape is fragmented, consisting in case-specific rulings and conflicting state positions. While some jurisdictions, such as the United States, reject the human rights applicability outside their borders, other states (for instance, European states, influenced by the ECtHR jurisprudence) have demonstrated a readiness to adhere to these legal standards.[100]

[95] UN Human Rights Committee, *General Comment No 36 (2018) on Article 6 of the International Covenant on Civil and Political Rights, on the Right to Life* (30 October 2018) UN Doc CCPR/C/GC/36, para. 28
[96] Bantekas and Oette (n. 94) 373-374
[97] *Legality of the Threat or Use of Nuclear Weapons* (Advisory Opinion) [1996] ICJ Rep 226
[98] The Lex Specialis Doctrine will be analyzed in the next section of this thesis.
[99] *Nuclear Weapons*, para 25
[100] Ralph Wilde, 'The Extraterritorial Application of International Human Rights Law on Civil and Political Rights' in Scott Sheeran and Nigel S Rodley (eds), *Routledge Handbook of International Human Rights Law* (Routledge 2013), pp. 635-636

Contingent upon the wording of a human rights treaty, the scope of application may change depending on the requirements of "territory" or "jurisdiction". The scope of application means the correlation between the state and either the territory where the act occurred (territorial model) or the individual affected by it (personal jurisdiction model). According to certain international instruments, a state's responsibility depends on its jurisdiction; for instance, article 2(1) of the ICCPR provides "Each State Party to the present Covenant undertakes to respect and ensure to all individuals within its territory and subject to its jurisdiction the rights recognized in the present Covenant".[101] Other UN treaties employ different formulations that imply a primarily territorial application. For example, the Convention on the Rights of Persons with Disabilities extends its reach to all parts of federal states without exception (Article 4(5) CRPD). On the other hand, the International Covenant on Economic, Social and Cultural Rights is silent on "competence" and "territory", implying that its obligations apply regardless of location.[102]

In the context of armed conflict, a context-sensitive assessment of the environment is necessary to determine a state's human rights obligations. There are two principal models of jurisdiction used to analyze the applicability of extraterritoriality. First, the spatial model arises when a state exercises effective control over a foreign territory; for instance, in situations of occupation. Therefore, human rights obligations extend to all individuals within that territory.[103] This approach has been developed in the jurisprudence of the European Court of Human Rights, for instance, in the case Loizidou v. Turkey.[104] The second model is the personal model of jurisdiction, which applies when a state, through its agents, exercises control or authority over specific individuals outside its territory. This was established by the ECtHR in the case Al-Skeini v. The United Kingdom.[105]

In the context of AWS, the application of these jurisdictional models depends on the specific manner in which control and authority are exercised. Under the spatial model, extraterritorial obligations could be engaged where AWS are deployed in a territory over which the state exercises effective control, such as in situations of occupation or comparable forms of *de facto* authority. By contrast, the personal model may be relevant where individuals outside the state's territory are directly targeted or affected through the actions of state agents deploying AWS. In both cases, the determining factor is whether the use of AWS can be attributed to state agents exercising sufficient control or authority over the relevant persons or area, thereby bringing affected individuals within the scope of the state's human rights obligations. Indeed, the

[101] ICCPR art. 2(1). See also art. 2(1) of the 1984 Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment; art. 2(1) of the 1989 Convention on the Rights of the Child; and art. 1 of the European Convention on Human Rights
[102] Olivier De Schutter, *International Human Rights Law* (3rd edn, Cambridge University Press 2019), pp. 146-147
[103] Ian Park, *The Right to Life in Armed Conflict* (Oxford University Press 2018), p. 71 https://doi.org/10.1093/oso/9780198821380.001.0001
[104] *Loizidou v. Turkey*, App. no. 15318/89 (ECtHR, 18 December 1996)
[105] *Al-Skeini and others v. United Kingdom*, App. no. 55721/07 (ECtHR, 7 July 2011)

"effective control" test becomes challenging to apply when an AWS operates independently on foreign territory and commits a violation.

2.3 The relationship between IHL and IHRL

IHL and IHRL were once considered two distinct fields of law with no overlap due to their different origins and conditions of application. However, the development of state practice and case law at international and domestic levels brought these two fields closer. As established by the ICJ in the Advisory Opinion Construction of the Wall in the Occupied Palestinian Territory[106], and in the case DRC v. Uganda, human rights conventions continue to apply in times of armed conflict together with IHL.[107] Therefore, IHL applies only to armed conflicts, while IHRL applies in both peacetime and wartime.[108] Regarding the interplay between these two regimes, the ICJ identifies three possible scenarios: "some rights may be exclusively matters of international humanitarian law; others may be exclusively matters of human rights law; yet others may be matters of both these branches of international law".[109]

2.3.1 Complementarity and Lex Specialis

There are instances where both IHL and IHRL are applicable, as they are largely complementary fields of international law. As highlighted by the definition of the principle of harmonization by the International Law Commission, "when several norms bear on a single issue they should, to the extent possible, be interpreted so as to give rise to a single set of compatible obligations".[110]

When obligations within IHL and IHRL are mutually compatible or inherently contradictory, legal consensus dictates the principle of "*lex specialis derogat legi generali*" which serves to determine the prevailing framework.[111] This principle "suggests that whenever two or more norms deal with the same subject matter, priority should be given to the norm that is more specific".[112] Following this approach, in times of armed conflict, IHL is the prevailing framework; however, it remains in a state of concurrent rather than exclusive application with IHRL.

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[106] *Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory (Advisory Opinion)* [2004] ICJ Rep 136, 178, para. 106

[107] *Armed Activities on the Territory of the Congo (Democratic Republic of the Congo v. Uganda)* (Judgment) [2005] ICJ Rep. 168, para. 216

[108] Alexander Orakhelashvili, 'The Interaction between Human Rights and Humanitarian Law: Fragmentation, Conflict, Parallelism, or Convergence?' (2008) 19(1) *European Journal of International Law*, p. 162

[109] *Wall (Advisory Opinion)*, para 106

[110] International Law Commission, 'Conclusions of the Work of the Study Group on the Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law' (2006) UN Doc A/CN.4/L.702, para. 1(4)

[111] Crawford and Pert (n. 5) 291

[112] ILC, 'Fragmentation of International Law' (n 110) para. 1(5)

This general principle of international law is used for interpretation and conflict resolution. For interpretation, it means that one legal framework can provide the necessary detail to interpret the other, using the most complete body of law available to address specific situations. In cases where the simultaneous application of both legal regimes produces a normative conflict, the *lex specialis* doctrine is used as a mechanism for reconciliation. Thus, in times of armed conflict, the specialized provisions of IHL take precedence over IHRL norms, since the specific context of hostilities renders the specialized framework more pertinent.[113] It should be underscored that each case of norm conflict must be analyzed in isolation to ascertain which norm qualifies as the specialized rule for a given problem. Indeed, priority is accorded to the provision characterized by a more restricted or specific material.[114]

However, it must be highlighted that this theoretical reconciliation of two different regimes can be more complicated in practice. Milanović argues that "*lex specialis* must be abandoned as a sort of magical, two-word explanation of the relationship between IHL and IHRL, as it confuses far more than it clarifies".[115] In fact, there might be cases in which IHL and IHRL are inherently incompatible, and any effort to harmonize them through the *lex specialis* doctrine risks eroding the specific safeguards provided by either framework.[116]

2.3.2 Relevance for the protection of victims

The concurrent application of IHL and IHRL has significant implications for the protection of victims during armed conflict. Both fields of law have as their core aim the protection of individuals.[117] IHL establishes the legal framework governing the conduct of hostilities, seeking to limit the harm through rules addressed to parties to the conflict. Therefore, it is primarily concerned with regulating state or non-state actors' behavior, not articulating individual entitlements.[118] As such, although this legal regime plays a central role in preventing unlawful harm, it does not always provide comprehensive mechanisms for ensuring accountability and redress. This is due to the fact that IHL and IHRL developed differently and not concurrently.[119] By contrast, IHRL is centered around the protection of individuals. Applicable both in peacetime and during armed conflicts, it expands on the rights protected by IHL. This body of law puts

[113] Crawford and Pert (n. 5) 291
[114] Marco Sassòli, 'The Role of Human Rights and International Humanitarian Law in New Types of Armed Conflicts' in Orna Ben-Naftali (ed.), *International Humanitarian Law and International Human Rights Law* (Oxford University Press 2011), p. 71
[115] Marko Milanović, 'Norm Conflicts, International Humanitarian Law, and Human Rights Law' in Orna Ben-Naftali (ed.), *International Humanitarian Law and International Human Rights Law* (Oxford University Press 2011), p. 98
[116] Ibid. p. 116
[117] Crawford and Pert (n. 5) 284
[118] International Committee of the Red Cross, *What is International Humanitarian Law?*. (ICRC Factsheet, July 2004) https://www.icrc.org/sites/default/files/document/file_list/what-is-ihl-factsheet.pdf
[119] Elizabeth Salmón and Juan Pablo Pérez-León-Acevedo, 'Reparation for Victims of Serious Violations of International Humanitarian Law: New Developments' (2022) 104 *International Review of the Red Cross*, pp. 1317-1318

emphasis on both substantive guarantees and procedural obligations of states, including investigations and accountability.[120]

The interaction between these two regimes contributes to a more comprehensive system of protection for victims during armed conflicts. The position of victims will be further analyzed in the next chapter of this thesis, where it will be argued that their protection becomes increasingly fragile due to the development and presence of autonomous weapons systems during armed conflicts. Their deployment risks widening accountability gaps, rendering compliance and the effective protection of victims more complex.

[120] UNHRC, General Comment No 36, paras 27–28

CHAPTER 3 - VICTIMS OF AUTONOMOUS WEAPONS SYSTEMS

3.1 The concept of victim under International Law

The legal classification of victimhood is the foundational trigger for rights and remedies. States are compelled to respect and enforce IHL and IHRL norms (included in treaties to which they are parties). Among these obligations, states have the duty to provide victims equal and effective access to justice and for reparations.

Understanding the different characterizations of victimhood is essential for assessing how harm caused by AWS is conceptualized and addressed in international law. Analyzing the position of victims in both IHL and IHRL is important to understand how these two approaches shape both the identification of individuals as victims and the legal consequences that follow, including the scope of protection afforded, the attribution of responsibility, and the availability of mechanisms for accountability and redress.

Historically, no civilization has ever denied individuals the right to seek justice for personal or material harm. The right to redress is an enduring feature for all organized legal systems, dating back to their earliest records. This standard governed private grievances where a governing body (e.g. community, a tribe, or a state) offered a structured venue to solve disputes and enforce remedies. The practice of compensating victims was deeply embedded in ancient religious doctrines and the first organized communities. Early legal systems have used different platforms for resolving these claims, varying significantly in their rules of access, procedure, remedies, and methods of adjudication.[121]

Despite this, victims were marginalized within the realm of international law. This was due to the state-centric view of the law of nations. In this classical Westphalian view, state interests and objectives were the priority, while individuals were considered “objects” rather than subjects. Their legal identity was effectively assimilated by the state, restricting their legal agency under international law. Individuals did not have rights at the international level and could not bring their claims before international fora.[122]

This conception of the individual as an object of international law changed in the aftermath of the Second World War. While the establishment of the Nuremberg and Tokyo trials introduced the principle of individual criminal responsibility, the subsequent development of international human rights regimes and individual complaint mechanisms further transformed the individual’s

[121] M Cherif Bassiouni, ‘International Recognition of Victims’ Rights’ (2006) 6(2) Human Rights Law Review, pp. 206-207

[122] Simone Gorski, ‘Individuals in International Law’ in Rüdiger Wolfrum (ed.), *Max Planck Encyclopedia of Public International Law* (Oxford University Press 2013) https://opil.ouplaw.com/display/10.1093/law:epil/9780199231690/law-9780199231690-e829

position within the international legal order.[123] By granting individuals direct access to international adjudicatory bodies, these mechanisms contributed to recognizing individuals as subjects of international law, with rights and obligations.

Following WWII, numerous global treaties and agreements codified the rights and stipulated protections for individuals, for instance, the Universal Declaration of Human Rights (1948), the European Convention on Human Rights (1950), and the International Covenant on Civil and Political Rights (1966). These instruments placed a clear obligation on sovereign states to integrate these standards into their own national legislation to ensure that they were effectively upheld.

In the following decades, particularly in the 1980s and 1990s, the push for victims' rights gained significant momentum. The creation of the International Criminal Court (ICC) alongside ad hoc and hybrid tribunals, combined with a surge in national-level trials and truth-seeking initiatives, firmly established the role of the victim on the global stage.[124] Furthermore, the right to reparation to victims was recognized in the ICC Statute.[125] Moreover, victims' rights were essentially fortified by the standards set forth in the 2005 Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law.[126]

3.1.1 Definition of Victim in International Law

There is no standard and binding definition of "victim" at the international level. This concept is highly contextual, largely because international law has historically focused on state responsibility rather than individual victimization. The current legal definition of "victim" is diverse, reflecting a broad spectrum of categories found across international norms. Despite this fragmentation, by analyzing the various components of these definitions, a common thread of core principles can be found, proving a general understanding of the elements that constitute victimhood. International legal standards regarding victims are broad and encompass several distinct groups, including victims of crime, victims of abuse of power, victims of enforced disappearance, victims of violation of international criminal law, victims of terrorism, and victims of gross violations of IHRL and serious violations of IHL.[127]

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[123] Annalisa Ciampi, Taxiarchis Fiskatoris and Raghavi Viswanath, 'International Criminal Law' in *The Routledge Handbook of International Criminal Law* (Routledge 2024), pp. 621-622
[124] Bassiouni (n. 121) pp. 209-211
[125] Rome Statute of the International Criminal Court Art 75, 2187 UNTS 3 (adopted 17 July 1998, entered into force 1 July 2002)
[126] UN General Assembly, *Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law* (UNGA Res 60/147, 16 December 2005)
[127] Carlos Fernández de Casadevante, 'Sovereignty and Human Rights' (2010) *Max Planck UNYB* 14, p. 237

While not universally binding, two UN instruments serve as a foundation to define victims. The 1985 UN Declaration of Basic Principles of Justice for Victims of Crime and Abuse of Power, adopted by General Assembly resolution 40/34[128], represented the first global framework to formally define victims' rights to judicial access and compensation. This instrument differentiates between "victims of crime" (those harmed by individuals violating domestic criminal law) and "victims of abuse of power" (where the injury results from the state's actions).[129] It outlines various definitions of victimization and a comprehensive set of entitlements, including the right to judicial access and equitable treatment, which is directly tied to the ability to receive compensation.[130]

Moving beyond the scope of the mentioned Declaration, the 2005 Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law provide for the definition of victims of gross violations of IHRL and serious violations of IHL. Principle 8 recites:

> "For purposes of the present document, victims are persons who individually or collectively suffered harm, including physical or mental injury, emotional suffering, economic loss or substantial impairment of their fundamental rights, through acts or omissions that constitute gross violations of international human rights law, or serious violations of international humanitarian law. Where appropriate, and in accordance with domestic law, the term "victim" also includes the immediate family or dependants of the direct victim and persons who have suffered harm in intervening to assist victims in distress or to prevent victimization".[131]

In this definition, different categories of individuals are considered victims. First of all, the direct victims, those who have personally sustained harm as a result of a violation. This classification extends to those closely connected to the primary victim, such as family members and dependents, recognizing that the impact of a violation often ripples outward to harm their immediate support system. The scope of victimization also extends to third parties who suffer personal harm as a result of their efforts to assist or intervene on behalf of the primary victim.

Finally, collective victims are entities or groups targeted not as individuals but as representatives of a shared identity or purpose. This category includes organizations dedicated to religious, cultural, educational, or charitable missions. Moreover, this group comprehends individuals who

[128] UN General Assembly, *Declaration of Basic Principles of Justice for Victims of Crime and Abuse of Power* (UNGA Res 40/34, 29 November 1985).
[129] Bassiouni (n. 121), p. 247
[130] Fernández de Casadevante (n.127), p. 224
[131] UNGA Res 60/147, Principle 8

are targeted specifically because of their shared characteristics, regardless of the underlying political or historical causes of the conflict.[132]

3.2.1 Victims in International Humanitarian Law

IHL does not provide an explicit definition of "victim"; instead, it identifies specific categories of persons who are entitled to protection during armed conflict. Once an individual is identified within one of these groups, they are legally protected from attack. The central objective of IHL is to limit the effect of armed conflict by regulating the conduct of hostilities and by ensuring humane treatment of those protected groups. Therefore, the focus is not the recognition of an individual legal status of victimhood but rather on the application of objective legal protections to certain categories of persons based on their position in the conflict. According to the principle of distinction, IHL distinguishes between individuals who may be lawfully targeted (combatants) and those who cannot be the objects of attack, civilians and individuals who are *hors de combat* (such as the wounded and sick on land, the wounded, sick, and shipwrecked at sea, and prisoners of war)[133]. These categories constitute the basis upon which this legal regime of protection is constructed.[134]

Rather than using the word "victim" as a legal status, the Geneva Conventions and their Additional Protocols use it as a general term to describe anyone affected by the conflict who is entitled to protection.[135] In IHL, victims are functionally defined by their specific circumstances. Civilians are afforded general protection against the dangers arising from military operations, and attacks directed against them are prohibited.[136] When such rules are violated, individuals who suffer harm as a result are considered victims. Nonetheless, it is important to understand the requirements of victimhood. This means that an individual must have sustained injury resulting from a breach of international law and there must be a sufficiently close causal relation between

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[132] Sabine Mandl and Julia Planitzer, 'Who is a Victim? The Concept of Victim in the Victims' Rights Directive: A Human Rights Analysis of the Concept of Victim from a Gender-Specific Perspective' (2022) 12 *SIAK-Journal – Journal for Police Science and Practice (International Edition)* 49, pp. 52-53

[133] Geneva Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (adopted 12 August 1949, entered into force 21 October 1950) 75 UNTS 31, Art. 13
Geneva Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea (adopted 12 August 1949, entered into force 21 October 1950) 75 UNTS 85, Art. 13
Geneva Convention (III) relative to the Treatment of Prisoners of War (adopted 12 August 1949, entered into force 21 October 1950) 75 UNTS 135, Art. 4
Geneva Convention (IV) relative to the Protection of Civilian Persons in Time of War (adopted 12 August 1949, entered into force 21 October 1950) 75 UNTS 287, Art. 4

[134] International Committee of the Red Cross (ICRC), 'Rule 1: The Principle of Distinction between Civilians and Combatants' *Customary IHL Database* https://ihl-databases.icrc.org/en/customary-ihl/v1/rule1

[135] The 1977 Protocols are officially titled Protocol Additional to the Geneva Conventions of 12 August 1949 and Relating to the Protection of Victims of International Armed Conflicts (Protocol I) and Protocol Additional to the Geneva Conventions of 12 August 1949 and Relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II).

[136] Art. 27 GC IV; Arts. 48 and 51 AP I

the harm suffered and the conduct in violation.[137] In armed conflict, harm can arise both from lawful and unlawful conduct. According to Articles 51(5)(b) and 57(2)(b) of AP I, states must avoid any attack directed towards civilians, causing loss of civilian life and injury, that would be disproportionate to the expected military gain.[138] Essentially, while incidental civilian harm can be considered legally lawful if proportionate to military necessity, it becomes a violation if it is excessive.[139]

This distinction between lawful and unlawful attack is vital for determining legal liability for reparations. Even if one could argue that all victims of the same military operations deserve equal treatment, regardless of the nature of the attack, without this threshold it would be impossible to establish whether an obligation to compensate exists or to identify exactly who is responsible for providing redress.[140]

Under the IHL regime, the position of victims is primarily indirect. In fact, the protection of victims is achieved through the regulation of the conduct of the parties to a conflict rather than through the recognition of enforceable individual rights. As it will be later demonstrated, this conduct-oriented and category-based approach has important implications when assessing harm caused by autonomous weapons. These limitations highlight the importance of considering complementary legal frameworks, particularly IHRL, when addressing the rights and protections of victims in armed conflict.

3.3.1 Victims in International Human Rights Law

IHRL adopts an explicitly individual-centered approach to the notion of victim. Within this framework, individuals are recognized as right-holders entitled to invoke legal protections against the state. In fact, victimhood is closely linked to the existence of a violation of a protected right. Compared to IHL, which primarily regulates the conduct of states' parties to a conflict, IHRL establishes direct legal relationships between individuals and states, giving rise to both substantive and procedural obligations. States must not only refrain from unlawful interference with rights but also take active measures to protect individuals from harm. This includes the obligation to prevent violations, to conduct effective investigations where violations are alleged, and to ensure accountability for unlawful acts.[141] Therefore, individuals who qualify as victims under IHRL are not merely beneficiaries of protective rules but also potential

[137] Shinya Furuya, Carlos Correa, and Clara Sandoval, 'The Right to Reparation for Victims of Armed Conflict: The Intertwined Development of Substantive and Procedural Aspects' in Shinya Furuya, Carlos Correa, and Clara Sandoval (eds.), *Reparation for Victims of Armed Conflict* (Cambridge University Press 2020), p. 58
[138] Arts. 51(5)(b) and 57(2)(b) AP I
[139] Crawford and Pert (n. 5) 200-201
[140] Furuya et al (n. 137), p. 56
[141] Danwood Mzikenge Chirwa, 'The Doctrine of State Responsibility as a Potential Means of Holding Private Actors Accountable for Human Rights' (2004) 5 *Melbourne Journal of International Law*, p. 4

claimants who may seek recognition, justice, and reparations through domestic or international mechanisms.

Although human rights treaties do not always provide a comprehensive definition of victimhood, this concept has been developed through jurisprudence and soft law instruments. As previously stated, the 2005 UN Basic Principles and Guidelines on the Right to a Remedy and Reparation offer a definition of the term, framing victims as individuals who have suffered harm as a result of violations of internationally recognized human rights, encompassing physical or mental injury, emotional suffering, economic loss or the impairment of their fundamental rights.[142] As also established by other international and regional human rights bodies, family members and dependents of the primary victim may also qualify as victims, particularly in situations in which they experience harm as a consequence of the original violation; this could be, for example, psychological suffering or the denial of information regarding the status of the primary victim.[143] For instance, according to the International Convention for the Protection of All Persons from Enforced Disappearance (ICPPED), the families of victims of enforced disappearance are specifically recognized as victims of the violation itself. This instrument entitles families to reparation and to know the truth about the fate of the disappeared person.[144]

This right-based approach to victimhood offered by IHRL is significantly important to assess the impact that AWS can have on victims. In particular, it highlights the importance of ensuring that individuals affected are not only protected against unlawful harm but are also able to access mechanisms of accountability and redress, as it will be analyzed in the subsequent parts of this thesis.

The 2005 Basic Principles and Guidelines reflect a conscious attempt to converge the two separate fields of IHL and IHRL. By creating a unified framework centered on the victim, this approach acknowledges that for those experiencing harm, the formal boundaries between these legal regimes may undermine effective protection.[145] Therefore, addressing the impact of AWS requires an analysis that does not remain confined within a single legal framework but instead draws on the complementary strengths of both IHL and IHRL in order to provide a more coherent and effective response.

3.4.1 Victims in International Criminal Law

International criminal law (ICL) addresses individual criminal responsibility for the gravest violations of international law (genocide, crimes against humanity, war crimes, and crimes of aggression). Under ICL, victimhood is linked to the existence of harm resulting from

[142] UNGA Res 60/147, Principle 8
[143] Fernández de Casadevante (n.127) p. 241
[144] International Convention for the Protection of All Persons from Enforced Disappearance (adopted 20 December 2006, entered into force 23 December 2010) 2716 UNTS 3
[145] Bassiouni (n. 121), p. 255

internationally wrongful conduct; however, the relevant conduct is specifically limited to the commission of crimes falling under the jurisdiction of international criminal tribunals. Within this framework, victims are not merely passive beneficiaries of protection but are increasingly recognized as participants in processes of accountability, justice, and reparations.

The International Criminal Court (ICC) introduced a more victim-oriented regime by formally recognizing victims as participants in proceedings and by providing mechanisms for reparations.[146] According to Rule 85 of the ICC Rules of Procedure and Evidence, victims are "natural persons who have suffered harm as a result of the commission of any crime within the jurisdiction of the Court".[147] In certain circumstances, the definition also covers organizations and institutions "that have sustained direct harm to any of their property which is dedicated to religion, education, art or science or charitable purposes, and to their historic monuments, hospitals and other places and objects for humanitarian purposes".[148] Furthermore, victimhood may extend beyond direct victims to include indirect victims, such as family members or dependents who suffer harm as a consequence of the crime committed against the primary victim.[149]

According to article 68(3) of the Rome Statute, victims have the right to present their views and concerns directly during judicial proceedings.[150] The development of victims' rights within this regime has reinforced the connection between accountability and reparations. In fact, article 75 of the ICC Statute mandates the ICC to establish "principles relating to reparations to, or in respect of, victims, including restitution, compensation and rehabilitation".[151]

In the context of AWS, the framework provided by ICL becomes relevant when the deployment of such systems may result in unlawful conduct amounting to war crimes or other serious international crimes. In such instances, the recognition of victims contributes to identifying the harms suffered and to framing the forms of accountability and reparative justice available.

3.2 Substantive rights affected by Autonomous Weapons Systems

This section analyzes how AWS can breach different principles and human rights obligations.

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[146] Mansi Dagras, *The Protection of Victims under International Criminal Law* (SSRN Working Paper, 19 August 2021), pp. 6-7 https://ssrn.com/abstract=3908146
[147] Rules of Procedure and Evidence of the International Criminal Court, Rule 85(a), ICC-ASP/1/3 (part II-A) (adopted 9 September 2002)
[148] Ibid. Rule 85(b)
[149] Dagras (n. 146) pp. 1-2
[150] International Criminal Court, 'Victims' (ICC Official Website) https://www.icc-cpi.int/about/victims
[151] Rome Statute, art. 68(3)

3.2.1 Right to life

As pointed out by the Human Rights Committee in General Comment No. 36, "the development of autonomous weapon systems lacking in human compassion and judgment raises difficult legal and ethical questions concerning the right to life".[152] While the Committee does not deem such systems per se unlawful, it emphasizes the risk that their use may lead to arbitrary deprivation of life. The right to life may be violated since the lack of human qualities poses a significant challenge in achieving compliance with international standards. The deployment of AWS threatens the core principles of distinction and proportionality mandated by IHL. It is highly questionable whether AWS can effectively distinguish between lawful and unlawful targets. Consequently, these systems may engage in the arbitrary targeting of civilians, resulting in violation of the right to life.[153] AWS lack the contextual awareness and subjective reasoning essential for human soldiers to evaluate threats and the necessity of force. Even when an AWS targets correctly, the scale of force deployed may remain disproportionate. In armed conflict, this manifests as a failure of mitigating incidental harm. Since these systems are confined by their initial programming and training datasets, they are unlikely to precisely assess proportionality. AI can adapt to environmental changes; however, it lacks the high-level cognitive processes (typical of a human being) required to navigate unforeseen scenarios and determine the ethically appropriate level of force.[154]

Serious violations arising from the development and deployment of AWS may also amount to core international crimes, in particular war crimes where unlawful attacks intentionally or recklessly may target civilians or cause disproportionate civilian harm. Depending on the contextual elements and intent requirements, the use of AWS could also contribute to crimes against humanity or genocide. In this context, the right to life operates not only as a protected human right but also as a foundational interest underlying the prohibition of the most serious international crimes.

3.2.2 Principle of human dignity

Currently, AWS are highly debated in the discourse regarding human dignity. This principle is a core value that guided the development of IHRL and IHL and informs the interpretation of several rights.[155] All human beings have an inherent right to human dignity.[156] It has been argued that delegating the power of lethal decision-making to AWS represents a fundamental devaluation of human life. Indeed, these systems are incapable of attributing intrinsic worth to

[152] UNHRC, General Comment No 36, para. 65
[153] Asif Ali and Subramanian Ramamurthy, 'Humanity at the Crossroads: Human Rights Challenges in the Age of Lethal Autonomous Weapon Systems' (2025) 53(1) *International Journal of Legal Information*, p. 7
[154] Christof Heyns, 'Autonomous Weapons Systems: Living a Dignified Life and Dying a Dignified Death' in Nehal Bhuta and others (eds.), *Autonomous Weapons Systems: Law, Ethics, Policy* (Cambridge University Press 2016), p. 9
[155] For instance, the prohibition of inhuman treatment and arbitrary deprivation of life, both of which may be affected by the use of AWS.
[156] UDHR, Art. 1

human existence. Lacking emotional traits like compassion, which can prevent unnecessary suffering, AWS operate through data-driven processes that effectively dehumanize the individual, reducing life-and-death decisions to mere algorithmic outputs.[157]

Granting a machine the power and the authority to take a life is fundamentally disrespectful to the victim in so far as it diminishes their humanity. Preserving the sanctity of life requires that lethal decisions remain strictly a human responsibility; delegating such powers to algorithms (incapable of fully comprehending human worth) constitutes a severe breach of the principle of human dignity.[158]

Moreover, AWS are intrinsically incapable of experiencing the human qualities of empathy and compassion, which serve as vital moral safeguards against killing. Since these machines can never endure physical or psychological distress, they are unable to comprehend the weight of suffering in others. These systems lack the instinctual human resistance to killing, a natural emotional barrier that often protects human life more effectively than the baseline requirements of international law (for instance, a soldier on the battlefield may choose to spare an enemy's life out of mercy, even when the law does not explicitly require them to do so).[159]

The decision to use force by an autonomous system is restricted by the narrow parameters of its programming, leading to an incomplete assessment of the environment. These weapons lack the ability to interpret human mannerisms or backgrounds and cannot view a target as a human being. This creates a moral vacuum where the individual's value is not considered at any stage of the operation.[160]

3.2.3 Right to privacy

AWS may infringe upon people's right to privacy. These concerns are more central to the technical evolution and surveillance capabilities of autonomous systems than to the use of force. States may only legally restrict the right to privacy under specific circumstances, provided that such interference is neither unlawful nor arbitrary.[161] This high threshold for restriction is increasingly relevant in the era of AI; as highlighted by the UN General Assembly, "the

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[157] Human Rights Watch and Harvard Law School International Human Rights Clinic, *A Hazard to Human Rights: Autonomous Weapons Systems and Digital Decision-Making* (Human Rights Watch 28 April 2025), p. 30 https://www.hrw.org/report/2025/04/28/a-hazard-to-human-rights/autonomous-weapons-systems-and-digital-decision-making

[158] Christof Heyns, 'Autonomous Weapons Systems and Human Rights Law' (Presentation at the Informal Expert Meeting of States Parties to the Convention on Certain Conventional Weapons, Geneva, 13–16 May 2014) https://www.ohchr.org/en/statements-and-speeches/2014/07/presentation-made-informal-expert-meeting-organized-state-parties

[159] HRW and IHRC, *A Hazard to Human Rights* (n 157), pp. 32-33

[160] Mary Ellen O'Connell, 'Banning Autonomous Weapons: A Legal and Ethical Mandate' (2023) 37(3) *Ethics & International Affairs*, pp. 287–298

[161] UN Human Rights Committee, *General Comment No 16: Article 17 (Right to Privacy)* (8 April 1988), paras. 3-4

conception, design, use, deployment and further development of new and emerging technologies, such as those that involve artificial intelligence, may have an impact on the enjoyment of the right to privacy and other human rights".[162]

AWS pose a severe threat because their functionality depends on intrusive, mass-scale data collection that bypasses individual consent. States are under an obligation to uphold privacy rights extraterritorially; however, the widespread surveillance needed to train these systems often constitutes an arbitrary intrusion. Furthermore, the "black box" nature of AI means that the logic behind lethal decisions remains hidden from scrutiny. When personal data is uploaded into these opaque algorithms, it becomes obfuscated, leading to a loss of data control for all parties involved (such as the data collector and the data target). This lack of transparency facilitates unregulated use of sensitive information, turning personal data into tools for automated warfare.[163]

3.2.4 Principle of non-discrimination

The widespread collection and processing of personal data may undermine the principle of non-discrimination. The integration of machine learning into autonomous weapons allows for real-time data adaptation, which inherently reduces the predictability of the system's behavior and risks entrenching algorithmic biases. In fact, the biases of developers and engineers may be hard-coded into the system's architecture, eventually dictating lethal decision-making processes. Algorithms may reflect and amplify historical inequities and social prejudices.[164] The use of AWS places marginalized groups at an uneven risk of being misidentified, leading to potentially fatal errors. For instance, research demonstrated that individuals of color are disproportionately vulnerable to being misidentified by AI. Specifically, studies have confirmed that facial recognition technologies exhibit significantly lower accuracy rates when processing data from individuals with darker skin tones.[165] Facial recognition systems are also less effective for women, amounting to sex and gender discrimination. Moreover, AWS pose a unique threat to persons with disabilities due to the inherent complexity of human impairment. Disabilities are diverse and dependent on specific environmental contexts; therefore, they cannot be simplified into a binary logic required by targeting algorithms. This makes it difficult for AWS to accurately assess or protect individuals with disabilities in armed conflict.[166]

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[162] UN General Assembly, *The Right to Privacy in the Digital Age* (UNGA Res 75/176, 16 December 2020), para. 6
[163] HRW and IHRC, *A Hazard to Human Rights* (n 157), p. 51
[164] Mary Wareham, 'The Future of Artificial Intelligence', Human Rights Watch (2022) https://www.hrw.org/news/2022/11/28/future-artificial-intelligence
[165] Beth Findley, 'Why Racial Bias is Prevalent in Facial Recognition Technology' (Harvard Journal of Law & Technology Digest, 3 November 2020) https://jolt.law.harvard.edu/digest/why-racial-bias-is-prevalent-in-facial-recognition-technology
[166] HRW and IHRC, *A Hazard to Human Rights* (n 157), pp. 42, 44

3.2.5 Right to remedy

The right to a remedy serves as a crucial enforcement mechanism for violations of human rights by providing a framework for assigning liability following an AWS's deployment. This right is provided in many human rights treaties; for instance, in article 8 of the UDHR and article 2(3) of the ICCPR. These instruments mandate that states ensure individual accountability by initiating proceedings against those responsible for severe human rights violations.[167] Furthermore, states are obliged to investigate allegations of violations and bring perpetrators to justice. In the context of armed conflict, the deployment of AWS is likely to create an accountability gap that directly violates the right to a remedy. This legal vacuum arises because it remains unclear who can be held liable when a machine operating without meaningful human control makes lethal decisions.[168] This issue will be further analysed in the next section of this thesis.

3.3 Harm caused by Autonomous Weapons Systems

While AWS may generate multiple forms of harm associated with violations of both IHL and IHRL, this section primarily focuses on harm arising from serious violations of IHL during the conduct of hostilities.

Harm constitutes the central element through which individuals are recognized as victims. In the context of armed conflict, such harm may take multiple forms: loss of life, physical injury (e.g., mutilation), mental harm (e.g., psychological trauma), economic/material harm (e.g., destruction of property), and the impairment of fundamental rights (e.g., denial of basic human rights, such as the right to security).[169] While these forms of harm are not unique to the deployment of AWS, the manner in which they are produced is increasingly shaped by the technological characteristics of such systems. Unlike conventional weapons, AWS operate through processes that partially or fully replace direct human decision-making in the application of force. Therefore, harm may arise from a combination of pre-programmed parameters, sensor-based inputs, and adaptive or algorithmic processes.[170]

This can affect not only the occurrence of harmful outcomes, but also the ways in which such outcomes are understood and evaluated from a legal perspective. In particular, the deployment of AWS may increase the difficulty in the identification of the immediate causes of harm, as well as the assessment of whether such harm results from lawful or unlawful conduct. Moreover, harm generated by AWS is not only limited to its immediate physical effects. The increasing reliance on automated decision-making in life-and-death contexts raises broader concerns relating to human dignity and the dehumanization of targeting processes. Even if these elements are not

[167] Ali and Ramamurthy (n. 153), p. 10
[168] HRW and IHRC, *A Hazard to Human Rights* (n 157), p. 56
[169] UNGA Res 60/147, Principle 8
[170] International Committee of the Red Cross (ICRC), *Autonomous Weapon Systems: Technical, Military, Legal and Humanitarian Aspects* (Expert Meeting, Geneva, 26–28 March 2014, published November 2014), p. 40

easily quantifiable, they remain relevant to the legal characterization of harm, particularly within a human rights framework.[171]

In this regard, the analysis of harm in the context of AWS requires a broader understanding that goes beyond traditional categories, taking into account both the material consequences of the use of force, including consequent violations of human rights, and the specific features introduced by technological mediation.

3.3.1 Civilian harm and unlawful attacks

IHL seeks to regulate the conduct of hostilities in order to limit the effects of conflicts on persons not participating in it. However, not all harm inflicted upon civilians constitutes, in itself, a violation. Humanitarian law instruments recognize that incidental civilian harm may occur as a consequence of military operations, provided that such harm is in compliance with the principles governing the use of force.[172] As mentioned before, the legal qualification of individuals as victims depends not only on the fact that harm has occurred but also on whether that harm is the result of conduct that violated international provisions. Therefore, the concept of unlawful attack is fundamental in determining whether civilian harm gives rise to legal responsibility.

The principle of distinction is at the basis for the distinction between a lawful and an unlawful attack. As described in the second chapter, this principle requires parties to an armed conflict to distinguish at all times between combatants and civilians and to direct attacks only against lawful military targets.[173] The application of this principle presupposes the ability to identify targets accurately and to interpret complex contextual information (such as the behavior and intent of the opposing party and the environment where the conflict is taking place). The use of AWS in targeting processes raises concerns in this respect.[174] These AI-based systems rely on advanced sensors and data processing mechanisms; however, their capacity to interpret nuanced and context-dependent indicators remains limited.[175] Errors and biases in data inputs or the inability to rapidly adapt to changing environments may lead to misidentification of targets. In such cases, attacks carried out by AWS may amount to unlawful attacks against civilians, violating the principle of distinction.[176]

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[171] HRW and IHRC, *A Hazard to Human Rights* (n 157)
[172] Aurel Sari, 'Indiscriminate Attacks and the Proportionality Rule: What is Incidental Civilian Harm?' (12 June 2025) SSRN, p. 2 https://ssrn.com/abstract=5294476
[173] ICRC, *Customary IHL*, Rule 1 (n. 69). See also AP I Art. 48.
[174] Abhimanyu George Jain, 'Autonomous Weapon Systems, Errors and Breaches of International Humanitarian Law' (2023) 21(5) *Journal of International Criminal Justice*, p. 1012 https://doi.org/10.1093/jicj/mqad043
[175] Human Rights Watch and Harvard Law School International Human Rights Clinic, *Mind the Gap: The Lack of Accountability for Killer Robots* (Human Rights Watch, 9 April 2015), p. 8 https://www.hrw.org/report/2015/04/09/mind-gap/lack-accountability-killer-robots
[176] Jain (n. 174), pp. 1019-1020

The delegation of qualitative and context-sensitive balancing exercises to AWS presents significant challenges. These are elements necessary to conform with the principle of proportionality, involving the evaluation of the anticipated military gain and potential civilian harm.[177] Unlike human decision-makers, who may rely on experience, judgment, and ethical consideration, AWS operate through predefined parameters. The translation of qualitative legal standards into quantifiable variables risks that proportionality assessments may be reduced to simplified calculations that fail to capture the complexities inherent to armed conflict. Therefore, AWS may generate outcomes that, according to their pre-programmed standards, formally appear compliant but, in practice, fail to respect the protective purpose of the principle of proportionality.[178] In those instances in which civilian harm exceeds military necessity, such attacks would constitute unlawful attacks; thus, individuals would be considered victims.[179]
Moreover, the effective implementation of requirements presupposed by the principle of precaution is at stake. The principle of precaution requires parties to take all feasible measures to verify that targets are lawful, to choose means and methods of warfare that minimize civilian harm, and to cancel or suspend attacks when it becomes apparent that the target is not a military objective or the attack would be disproportionate. Thus, it presupposes ongoing human oversight and the capacity to reassess decisions in light of new information.[180] The autonomy of AWS reduces opportunity for real-time intervention, particularly in "humans out-of-the-loop" systems where it is impossible for human operators to intervene. This raises the possibility that failures to verify targets or to stop unlawful attacks may occur as systemic failures of these weapons.[181]

Furthermore, the opacity of algorithmic decision-making processes, combined with the unpredictability of system behavior, may obscure the basis on which targeting decisions are made. This complicates the legal assessment of the attack.[182]

For these reasons, the deployment of AWS does not necessarily create new categories of harm, but it transforms the conditions under which harm occurs and is assessed. AWS make existing IHL violations more likely to happen and the legal classification harder to detect. If the unlawfulness of an attack cannot be clearly established or if the factors leading to the harm cannot be identified with sufficient precision, the capacity of international law to respond effectively to civilian harm may be significantly weakened. By complicating the application of core IHL principles and obscuring the line between lawful and unlawful conduct, AWS challenge the ability of existing legal frameworks to identify violations and to recognize and protect victims.

[177] Additional Protocol I, Article 51(5)(b). ICRC, Customary IHL Study, Rule 14.
[178] HRW and IHRC, *Mind the Gap* (n 175), p. 8
[179] ICRC, Autonomous Weapon Systems and IHL (n 76) 16
[180] Additional Protocol I, Article 57(1)
[181] ICRC, Autonomous Weapon Systems and IHL (n 76) 17-18
[182] HRW and IHRC, *A Hazard to Human Rights* (n 157), p. 58

3.4 Accountability and remedies for victims

As discussed in the preceding sections, the identification of harm and the recognition of individuals as victims do not in themselves ensure legal protection or redress. Within the international law framework, the recognition of victims under international law is closely connected to their right to obtain effective remedies and reparations. In this framework, accountability mechanisms play a central role, not only in identifying those responsible for unlawful harm, but also in enabling forms of reparation such as compensation, satisfaction, guarantees of non-repetition, and criminal or administrative sanctions. The emergence of AWS introduces additional complexity in this framework. Indeed, the deployment of such systems may complicate the assessment of whether harm is lawful or unlawful, particularly when decision-making processes are delegated to algorithmic systems. Moreover, when the causal chain leading to harm is obscured, or when the behavior of the system cannot be fully predicted, attributing responsibility becomes more difficult. Many scholars have pointed out the potential emergence of gaps in accountability. For instance, Asaro suggests that states and individuals may find it easy to escape legal and moral responsibility for their actions since clear norms for emerging technologies are lacking.[183] Similarly, Sparrow warns that AWS might create a vacuum when it becomes nearly impossible to fairly attribute the machine's autonomous decision to a human operator.[184]

Furthermore, the recognition of an individual as a victim is closely linked to the existence of a violation and the identification of a responsible actor. Where responsibility cannot be clearly established, the ability of victims to seek justice and obtain reparation may be significantly undermined.

3.4.1 Attribution of responsibility for unlawful harm

The attribution of responsibility is assessed within the existing frameworks of state responsibility for internationally wrongful acts and individual criminal responsibility for serious violations. Those frameworks are at the basis of international law, as they enable the identification of the actors to whom unlawful conduct can be legally imputed. However, their application is increasingly strained by the technological characteristics of AWS.

The law of state responsibility provides a broad framework for addressing violations of internationally wrongful acts. It dictates that a state is legally accountable for acts or omissions violating international obligations, requiring it to cease the wrongful conduct and make full

[183] Peter Asaro, 'Jus Nascendi, Robotic Weapons and the Martens Clause' in Ryan Calo, Michael A. Froomkin, and Ian Kerr (eds.), *Robot Law* (Edward Elgar Publishing 2016) https://peterasaro.org/writing/Asaro%20Jus%20Nascendi%20PROOF.pdf

[184] Robert Sparrow, 'Robots and Respect: Assessing the Case Against Autonomous Weapon Systems' (2016) 30(1) *Ethics & International Affairs*, p. 108

reparation.[185] It is governed by customary law and the Articles on the Responsibility of States for Internationally Wrongful Acts (ARSIWA).[186] In the context of AWS, it has the potential to preserve human responsibility, which may arise not only from the use of such systems in violation of the rules governing the conduct of hostilities but also from the failures in the development, testing, or deployment that lead to unlawful outcomes. Moreover, the doctrine of state responsibility addresses the fact that the conduct of hostilities is carried out by a complex and collective mechanism involving multiple actors, such as government agents, military personnel, and policymakers. However, the process of assigning state responsibility has always faced certain constraints and the innovative and unique characteristics of AWS exacerbate these legal issues.

A first issue can be recognized by the fact that IHL primary rules are framed as broad principles rather than specific prescriptions.[187] This lack of textual precision makes it difficult to determine which actions or omissions during the lifecycle of an AWS constitute a definitive breach of international law. For instance, translating fundamental prohibitions, such as the prohibition of indiscriminate attacks, into concrete technical standards applicable to algorithmic systems raises complex questions. In fact, it remains unclear how concepts such as foreseeability and control over the use of force should be interpreted when the behavior of a machine may not be entirely predictable.[188]

A second challenge concerns the identification of the relevant conduct attributable to the state. Since the state is a legal abstraction rather than a physical actor, its international liability is derived from the acts and omissions of human agents, acting as state officials, organs, or entities empowered to exercise governmental authority.[189] The whole lifecycle of AWS involves a multiplicity of actors across different stages (such as design, programming, testing, and deployment). The involvement of numerous actors (including private actors) further obscures the boundaries of attribution, raising questions as to how their conduct should be integrated within state responsibility.

Furthermore, since the framework of state responsibility is to effectively serve its deterrent purpose and, in this context, reinforce human agency within autonomous systems, it is necessary to delineate specific thresholds for the determination of violations. This requires a rigorous evaluation of which acts or omissions trigger international liability, specifically addressing

[185] Vishakha Jaiprakash Thanvi, 'State Responsibility under International Law' (2023) 6(1) *International Journal of Law Management & Humanities*, p. 486
[186] International Law Commission, *Articles on the Responsibility of States for Internationally Wrongful Acts* (2001) UN Doc A/56/10
[187] Eric David, 'Primary and Secondary Rules' in James Crawford, Alain Pellet, and Simon Olleson (eds.), *The Law of International Responsibility* (Oxford University Press 2010), pp. 27-34 https://doi.org/10.1093/law/9780199296972.003.0003
[188] Ali and Ramamurthy (n. 153), p. 11
[189] International Law Commission, *Articles on the Responsibility of States for Internationally Wrongful Acts* (2001), UN Doc A/56/10, ch. II

whether, and to what extent, the state should be held accountable for the unintended or unforeseen consequences of AI-led operations.[190]

These difficulties suggest that, while theoretically the law of state responsibility remains applicable, its effective application in the context of AWS depends on a clearer articulation of how existing obligations apply to technologically mediated forms of warfare. In particular, it is necessary to clarify what types of conduct (across the entire lifecycle of these systems) and what kinds of unintended or unforeseen effects should give rise to state responsibility.

The other mechanism to establish responsibility is through individual criminal responsibility. According to this doctrine, individuals may be held personally liable in case of commission of certain crimes deemed to be of international concern. Within the context of AWS, the potential for such liability arises from the commission of core international crimes, specifically genocide, crimes against humanity, crimes of aggression, and war crimes. For the purposes of this thesis, the analysis will be focused on war crimes.[191] In order to establish individual criminal responsibility, two requirements must be present: a material element (*actus reus*) and a mental element (*mens rea*).[192] Regarding the *actus reus*, questions arise as to how certain core prohibitions (e.g., the prohibition of indiscriminate attacks) should be applied in contexts where the harmful outcome results from the operation of an autonomous system rather than a direct human action. Similarly, the extent to which omissions (e.g., failures in the design or oversight of a system) can constitute the commission of a war crime remain unsettled. Moreover, the lack of explicit criminalization of certain obligations, such as the duty to take precaution in an attack, further complicates the attribution of criminal responsibility.[193]

International criminal law typically requires intent and knowledge to fulfill the requirement of *mens rea*. However, the deployment of AWS may involve a certain conduct that does not neatly fit within these categories.[194] Under the current regime, it remains unclear whether deploying a system (considering its uncertainties) could amount to recklessness sufficient to establish criminal liability. An operator who recognizes that an AWS attack could be indiscriminate, yet proceeds recklessly, may face liability for war crimes under Additional Protocol I, whereas such

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[190] Marta Bo, Laura Bruun, and Vincent Boulanin, *Retaining Human Responsibility in the Development and Use of Autonomous Weapon Systems: On Accountability for Violations of International Humanitarian Law Involving AWS* (Stockholm International Peace Research Institute (SIPRI), October 2022), p. 23 https://www.sipri.org/publications/2022/policy-reports/retaining-human-responsibility-development-and-use-autonomous-weapon-systems-accountability

[191] International Committee of the Red Cross (ICRC), 'Rule 156: Definition of War Crimes' *Customary IHL Database* https://ihl-databases.icrc.org/en/customary-ihl/v1/rule156

[192] Albin Eser, 'Individual Criminal Responsibility' in Antonio Cassese, Paola Gaeta, and John R. W. D. Jones (eds.), *The Rome Statute of the International Criminal Court: A Commentary* (Oxford University Press 2002), pp. 771-772

[193] Bo et al (n. 190) 27-28

[194] Rome Statute, art. 30

conduct might not meet the stricter requirements for prosecution under the Rome Statute.[195] The pre-programmed nature of these machines, combined with their potentially unpredictable behavior, hinders the determination of the mental element in relation to a specific harmful conduct.[196]

The deployment of AWS is characterized by a fragmented decision-making process due to the intervention of different actors across extended geographical areas and temporal dimensions compared to traditional weapons. Therefore, questions arise as to the extent to which responsibility can be attributed to military commanders who authorize the deployment of such weapons. The doctrine of command responsibility is frequently used as a corrective mechanism for the perceived accountability gap.[197] However, the applicability of command responsibility remains limited in the context of AWS, as it is easier to establish only where the commander maintains control (such as in "human-in-the-loop" or "human-on-the-loop" systems). By contrast, in fully autonomous systems, the commander's limited awareness of the weapon's function and decision-making processes makes it significantly more difficult to establish the requisites of knowledge and control necessary for command responsibility.[198]

Similarly, there are debates as to whether individuals involved at earlier stages of the process (such as developers and programmers) are also liable. Their position remains uncertain since their contribution is temporally and causally distant from the eventual harm; however, they are considered the only individuals with a potential full understanding of the system's design and functioning.[199]

Finally, the responsibility gap is further exacerbated by the opacity of algorithmic processes ("black-box problem"). This renders the establishment of the causal link between human conduct and harmful outcomes increasingly more difficult.[200]

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[195] The ICRC Commentary on Article 85 of Additional Protocol I (AP I) interprets the term "wilfully" to include recklessness. Conversely, Article 30 of the Rome Statute explicitly limits the default mental element to "intent and knowledge". See International Committee of the Red Cross (ICRC), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949* (Yves Sandoz, Christophe Swinarski, and Bruno Zimmermann eds., Martinus Nijhoff 1987), para. 3474 https://ihl-databases.icrc.org/en/ihl-treaties/api-1977/article-85/commentary/1987. Rome Statute of the International Criminal Court (adopted 17 July 1998, entered into force 1 July 2002), 2187 UNTS 3, art. 30

[196] Bo et al (n. 190) 31-32

[197] Article 86(2) AP I

[198] Yordan Gunawan, Muhamad Haris Aulawi, Rizaldy Anggriawan, and Tri Anggoro Putro, 'Command Responsibility of Autonomous Weapons under International Humanitarian Law' (2022) 8(1) *Cogent Social Sciences*, pp. 9-10 https://doi.org/10.1080/23311886.2022.2139906

[199] Bo et al (n. 190) 38

[200] Seumas Miller, 'Lethal Autonomous Weapon Systems (LAWS): Meaningful Human Control, Collective Moral Responsibility and Institutional Design' (2025) *Ethics and Information Technology*, p. 63

3.4.2 Victims' right to an effective remedy

The right of victims to an effective remedy serves as an indispensable prerequisite for the enforcement of the broader human rights framework. It constitutes a fundamental principle of IHRL and, increasingly, of IHL. It reflects the idea that where a right is violated, individuals must have access to mechanisms through which they can secure redress.[201] In this sense, the effectiveness of legal protections ultimately depends not only on the existence of substantive norms but also on the availability of procedures through which victims can seek recognition, accountability, and reparations.

The right constitutes the procedural gateway through which substantive forms of reparation are activated. These include not only compensatory measures but also forms of satisfaction, which may encompass investigative duties and the imposition of sanctions on responsible actors. In this sense, accountability mechanisms are embedded within the broader framework of reparation, particularly through their role in ensuring satisfaction and guarantees of non-repetition.

Traditionally, IHL operated through interstate mechanisms, whereby violations give rise to obligations between states rather than direct claims by individuals. Nonetheless, with time, there has been a gradual convergence between IHL and IHRL in this area, particularly through the recognition that individuals affected by armed conflict should be entitled to reparations for violation of international law.

In IHRL, the right to an effective remedy is clearly established. It is enshrined in various international instruments, such as article 8 UDHR "Everyone has the right to an effective remedy by the competent national tribunals for acts violating the fundamental rights granted him by the constitution or by law"[202], article 2(3) ICCPR, article 13 CAT, article 13 ECHR, and article 7(1)(a)(25) ACHR. This right is also recognized in the UNHCR General Comment No. 29.[203]

All these instruments provide for an obligation that encompasses both procedural and substantive dimensions. States are required not only to provide equal and effective access to justice but also to conduct prompt, thorough, and impartial investigations; to hold those responsible accountable; and to ensure adequate forms of reparations.[204]

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[201] Humberto Cantú Rivera, 'Article 8 - The Right to an Effective Remedy' in Gudmundur Alfredsson and Asbjørn Eide (eds.), *The Universal Declaration of Human Rights: A Common Standard of Achievement* (Martinus Nijhoff/Brill 2023), p. 175 https://doi.org/10.1163/9789004365148_010

[202] Universal Declaration of Human Rights (adopted 10 December 1948 UNGA Res. 217 A(III)), art. 8

[203] UN Human Rights Committee, *General Comment No. 29: States of Emergency (Article 4)* (31 August 2001), UN Doc. CCPR/C/21/Rev.1/Add.11, para. 14

[204] M Cherif Bassiouni, 'International Recognition of Victims' Rights' (2006) 6(2) Human Rights LaBassiouni (n. 121), p. 260

These requirements are reflected in the 2005 Basic Principles and Guidelines on the Right to a Remedy and Reparation. Principle 12 provides for equal and effective access to justice:

> "A victim of a gross violation of international human rights law or of a serious violation of international humanitarian law shall have equal access to an effective judicial remedy as provided for under international law. Other remedies available to the victim include access to administrative and other bodies, as well as mechanisms, modalities and proceedings conducted in accordance with domestic law. Obligations arising under international law to secure the right to access justice and fair and impartial proceedings shall be reflected in domestic laws. To that end, States should:
>
> (a) Disseminate, through public and private mechanisms, information about all available remedies for gross violations of international human rights law and serious violations of international humanitarian law;
>
> (b) Take measures to minimize the inconvenience to victims and their representatives, protect against unlawful interference with their privacy as appropriate and ensure their safety from intimidation and retaliation, as well as that of their families and witnesses, before, during and after judicial, administrative, or other proceedings that affect the interests of victims;
>
> (c) Provide proper assistance to victims seeking access to justice;
>
> (d) Make available all appropriate legal, diplomatic and consular means to ensure that victims can exercise their rights to remedy for gross violations of international human rights law or serious violations of international humanitarian law".[205]

Secondly, these principles provide for the right to adequate, effective, and prompt reparation for the harm suffered. Under international law, the entitlement to reparation is a direct consequence of a breach. This compensatory duty extends beyond the primary victim to include family members, dependents, and possible good Samaritans who assisted the primary victim. The scale of redress must be proportional to the severity of the injury or loss incurred.[206] Under domestic and international legal regimes, a state is required to provide reparation for conduct attributable to it that results in gross violations of IHRL and IHL. Furthermore, where liability is established against a private individual or legal entity, that party bears the obligation to directly compensate the victim or reimburse the state for any restorative payments already made.[207] Different forms of reparations are available: restitution, compensation, rehabilitation, satisfaction, and guarantees of non-repetition.[208]

Under Principle 22 of the 2005 Basic Principles, satisfaction may include measures such as the verification of facts, public acknowledgment of wrongdoing, judicial sanctions against

[205] UNGA Res 60/147, Principle 12
[206] Ibid. Principle 18
[207] Ibid. Principle 15
[208] Ibid. Principles 19, 20, 21, 22, 23

responsible actors, and commemorative measures. Accountability therefore constitutes not only a mechanism of enforcement but also a component of reparative justice itself.[209]

The deployment of AWS introduces significant obstacles to the complete realization of this right. As discussed in the previous section, the attribution of responsibility becomes more complex where decision-making processes are carried out by algorithmic systems. These difficulties have direct implications for victims' access to remedies, who may face substantial barriers in bringing claims or obtaining redress.

Victims face considerable difficulty in identifying both the appropriate legal forum and the specific liable party. This challenge is further exacerbated by the transnational character of AWS lifecycles; indeed, the development and operation of these systems frequently span across multiple jurisdictions and involve a diverse array of state and private actors. This complicates the possibility of pursuing legal action. Victims or their families may struggle to determine which court has jurisdiction over their claims (domestic or international) or whether any forum is available at all. Furthermore, issues of state immunity may limit the ability of victims to bring claims against states before foreign domestic courts, thereby restricting avenues for accountability.[210] Moreover, the involvement of different actors in the development (from programmers to manufacturers) and deployment (from commanders to military operators) of AWS creates significant uncertainty as to the attribution of responsibility. This fragmentation makes it difficult for victims to identify which entity can be held legally liable and, subsequently, which actor may be brought before a competent court, thereby obstructing effective access to justice.[211]

The effective pursuit of a remedy requires the ability to clearly establish a causal link between the conduct and the harm suffered. However, the "black-box" problem poses a barrier to the evidentiary requirements necessary for litigation. This is due to the fact that technical complexity and opacity of autonomous decision-making hinder access to relevant information. This lack of transparency may impede investigations, weaken judicial proceedings, and ultimately undermine the prospect of obtaining redress.[212] This matter has direct implications for the victims' right to truth, which is part of the guarantee of non-repetition. This right entails access to factual and other relevant information concerning the violation, including understanding how and why it occurred.[213] However, when harm is caused by opaque AWS, the information necessary to satisfy

[209] Ibid. Principle 22
[210] Marco Longobardo, 'State Immunity and Judicial Countermeasures' (2021) 32(2) *European Journal of International Law*, pp. 458-459
[211] Marta Bo, Laura Bruun, and Vincent Boulanin, *Retaining Human Responsibility in the Development and Use of Autonomous Weapon Systems: On Accountability for Violations of International Humanitarian Law Involving AWS* (Stockholm International Peace Research Institute (SIPRI), October 2022), p. 54 https://www.sipri.org/publications/2022/policy-reports/retaining-human-responsibility-development-and-use-autonomous-weapon-systems-accountability
[212] HRW and IHRC, *A Hazard to Human Rights* (n 157), pp. 59-60
[213] Bassiouni (n. 121), p. 257

this right may be inaccessible. Therefore, the "black-box" nature of these systems impedes the evidentiary requirements in individual claims and undermines broader truth-seeking processes. Opacity weakens accountability and the preventive function of non-repetition.

Another issue relates to the adequacy of reparation. Traditional models of reparation are based on the identification of a wrongful act and a responsible party.[214] When dealing with AWS, the harm could result from systemic failures in the design, deployment, or operation of these machines, rather than from a clearly identifiable individual decision. This renders the determination of appropriate forms of reparation (such as compensation or guarantees of non-repetition) more complex because it becomes difficult to attribute responsibility among multiple actors involved, as well as to identify measures capable of effectively preventing similar harm in the future.

These challenges highlight the fact that victims of harm caused by AWS may be left without effective remedies, despite the existence of legal norms specifically establishing such a right. International law instruments provide for a substantive right to reparation; however, it remains purely symbolic in practice due to the lack of transparency, traceability, and clear rules of attribution associated with AWS.[215]

[214] James Gallen, 'Reparations' in *Transitional Justice and the Historical Abuses of Church and State* (Cambridge University Press 2023), pp. 196-197
[215] Bassiouni (n. 121), p. 232

CHAPTER 4 - MEANINGFUL HUMAN CONTROL AS A SAFEGUARD FOR VICTIMS' RIGHTS

4.1 The emergence of the concept of Meaningful Human Control

The increasing integration of autonomous functions into weapons systems has exposed structural tensions within the existing framework of international law, in particular, regarding the preservation of human agency, the attribution of responsibility, and the protection of victims. As analyzed in the previous chapters of this thesis, the delegation of targeting procedures and decision-making functions to algorithmic processes challenges the human-centered assumptions that constitute the basis of IHL and IHRL.[216] The deployment of AWS complicates the application of core principles governing the use of force, obscures causal chains necessary for the attribution of responsibility, and creates significant obstacles for victims seeking recognition and reparation.

In response to these concerns, the concept of meaningful human control (MHC) has emerged within legal and policy debates as a potential framework for ensuring that the use of AWS remains subject to human judgment and accountability. MHC was first introduced by the British non-governmental organization "Article 36" in 2013, which called for a ban on fully autonomous weapons and "for a positive obligation in international law for individual attacks to be under meaningful human control".[217]

Although not explicitly codified in existing legal instruments, MHC can be understood as an implicit requirement derived from fundamental principles of international law (including IHL principles of distinction, proportionality, and precaution and IHRL obligations of respect for the right to life and effective remedies for violations).[218]

4.1.1 Definition of Meaningful Human Control

The concept of meaningful human control has gained prominence, as it might be a useful tool to address concerns regarding the dehumanization of lethal force applied by AWS and to provide a structural basis for legal accountability. This concept seeks to ensure that violations of international law can be traced back to entities with legal personality by imposing a mandatory human role in the decision-making cycle. However, it must be highlighted that the definition and

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[216] Berkant Akkuş, 'An Assessment of the Acceptance of Meaningful Human Control as a Norm of International Law in Armed Conflicts Using Artificial Intelligence' (2023) 81(3) *Journal of Ankara Bar Association*, p. 52

[217] Article 36, *Killer Robots: UK Government Policy on Fully Autonomous Weapons* (April 2013), p. 1 https://article36.org/wp-content/uploads/2013/04/Policy_Paper1.pdf

[218] Federal Republic of Germany, *Lethal Autonomous Weapon Systems (LAWS): Statement by Germany to the CCW Informal Meeting of Experts* (United Nations Office for Disarmament Affairs, Geneva, 2014) https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Informal_Meeting_of_Experts_(2014)/Germany%2BLAWS%2B2014.pdf

parameters of what constitute "meaningful" remain a subject of ongoing debate within the international community.[219] In fact, this term has evolved and been adopted across a spectrum of academic, non-governmental, and intergovernmental platforms.

As originally framed by the mentioned NGO Article 36, the concept functions as a tool designed to facilitate productive debate rather than providing a precise concept to put an end to the debate.[220] In the original report, Article 36 identified three elements constituting MHC: information (requiring full transparency regarding target rationale and weapon effects), action (requiring a proactive human command to initiate force), and accountability (ensuring that the personnel overseeing the process remain liable for potential operational consequences).[221] The application of this notion in the paper was deemed confusing by some scholars. The individual components of the proposed MHC framework exhibit specific limitations that cast doubt on their cumulative ability to constitute "meaningful control" as an independent legal standard. For instance, the requirement of information is already a pre-existing obligation under the law of armed conflict; therefore, it does not provide added value to MHC.[222] A key contributor to the concept's early development clarified that MHC was intended as a normative structural tester rather than a requirement for physical intervention, suggesting interpreting MHC as "a set of processes and rules, rather than physical control over weapons systems".[223]

Despite the absence of a fixed definition, this concept is not devoid of its content. In fact, scholars have identified certain core premises underlying the notion of MHC. First, there is a broad agreement that the complete removal of human control from the application of force is unacceptable. Second, it is equally recognized that purely formal or minimal human involvement does not satisfy the requirement of meaningful control.[224]

In this context, the concept of control must be understood in functional rather than purely mechanical terms. Human control is facilitated where the technology itself is predictable,

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[219] Carrie McDougall, 'Autonomous Weapon Systems and Accountability: Putting the Cart Before the Horse' (2019) 20 *Melbourne Journal of International Law*, p. 6

[220] Richard Moyes, 'Meaningful Human Control' in Robin Geiß (ed.), *Lethal Autonomous Weapons Systems: Technology, Definition, Ethics, Law and Security* (German Federal Foreign Office 2016), p. 239 https://www.auswaertiges-amt.de/resource/blob/204830/5f26c2e0826db0d000072441fdeaa8ba/abruestung-laws-data.pdf

[221] Article 36 (n. 217), p. 9

[222] Lena Trabucco, 'What Is "Meaningful Human Control," Anyway? Cracking the Code on Autonomous Weapons and Human Judgment' (Modern War Institute, 21 September 2023) https://mwi.westpoint.edu/what-is-meaningful-human-control-anyway-cracking-the-code-on-autonomous-weapons-and-human-judgment/

[223] Heather M Roff, 'Magnifying Human Confusion: Meaningful Human Control and the Ongoing Debate on Autonomous Weapons' (The Rule of Law Post, Centre for Ethics and the Rule of Law, 6 May 2024) https://www.penncerl.org/the-rule-of-law-post/magnifying-human-confusion-meaningful-human-control-and-the-ongoing-debate-on-autonomous-weapons/

[224] Simeon C. Calvert, 'Principles and Framework for the Operationalisation of Meaningful Human Control Over Autonomous Systems' (2025) 31(5) Science and Engineering Ethics, p.27 https://doi.org/10.1007/s11948-025-00554-z

reliable, and transparent to allow human operators to understand its functioning. Moreover, human control is not limited to the moment of activation of a system but extends across the broader lifecycle of its development and use. These characteristics are essential to ensure that human agents can anticipate how the system will behave and can align its operation with the intended military objective.

MHC depends on the availability of adequate information and the capacity for informed decision-making. Human control over an AWS also serves as a mechanism to achieve the commander's intent. This necessitates comprehensive intelligence regarding the intended military objective, as well as the specific collateral effects that a commander wishes to avoid. Such information is a prerequisite for a human operator to perform real-time assessments of an attack's legitimacy. These evaluations are contingent upon a technical understanding of the system's operational parameters. Furthermore, this concept of predictability is not solely a feature of the technology itself, but it provides a link between the human operator's intentions and the probable occurrence of outcomes that reflect that intent.[225] MHC implies the existence of temporal and operational proximity between human judgment and the use of force. In systems that operate over extended periods or with a high degree of autonomy, this may require the capacity for timely human intervention (e.g., the ability to supervise, modify, or abort an attack). This element is fundamental to ensure that human agents remain capable of responding to changing circumstances and preventing unlawful outcomes.[226]

Finally, it is imperative to analyze the term "meaningful" which is employed to specifically denote the threshold of substantive control (rather than superficial). It must be pointed out that the precise parameters of what constitutes "meaningful" remain undetermined. Thus, the qualifier "meaningful" acts as a linguistic placeholder since there are other words that could be used instead (e.g., effective, sufficient, appropriate, necessary). The preference for the term "meaningful" lies in its broad and principle-based character, which stands in contrast to more context-specific or outcome-oriented terms, such as appropriate or effective. The term "meaningful" emphasizes a qualitative human judgment, highlighting that control must be rooted in human comprehension and moral agency rather than functioning as a superficial or administrative checkbox.[227]

4.1.2 Meaningful Human Control in international discussions

As discussed above, MHC remains an indeterminate concept from a strictly legal perspective; however, it has become one of the central points of reference in international discussions concerning the regulation of AWS. Over the last decade, the notion has progressively evolved from an academic and civil society proposal making its way in diplomatic and institutional

[225] Moyes, 'Meaningful Human Control' (n. 220), p. 246
[226] Ibid. p. 248
[227] Ibid. p. 241

debates on the governance of lethal autonomous weapons. This growing prominence reflects a broader recognition that retaining some degree of human involvement in decisions over the use of force is essential to maintain legal accountability and safeguard human rights.[228]

The concept first gained visibility through the work of civil society organizations, particularly the NGO Article 36, which introduced MHC as a normative tool to frame discussions on the limits of autonomy in weapons systems. As previously discussed, Article 36 did not present the concept as a fixed legal standard.[229] However, the influence of this proposal rapidly extended beyond academic discourse. In 2014, MHC became a prominent notion within discussions under the framework of the Convention on Certain Conventional Weapons (CCW). In this environment, states underscored the potential of MHC as a constructive analytical framework for addressing the legal and ethical complexities surrounding the question of autonomy of these new kinds of weapons.[230]

Within the CCW process, the concept has acquired growing normative significance, despite the fact that states remain divided as to its precise meaning and legal implications. During the 2023 sessions of the Group of Governmental Experts (GGE) on LAWS, several delegations advocated for new legal restrictions, emphasizing MHC as a necessary condition for the unlawful use of such systems.[231] This trend was reflected also in the 2024 report of the UN Secretary-General (António Guterres), in which states identified preliminary indicators for assessing whether sufficient human control is maintained in relation to AWS. In particular,

> "States considered the necessary elements of human control, which included that humans retained the following:
>
> - Sufficient information, including on the capabilities of the weapons system and the operational context, to ensure compliance with international law
> - The ability to exercise their judgment to the extent required by international humanitarian law
> - The ability to limit the types of tasks and targets
> - The ability to place limitations on the duration, geographical scope and scale of use
> - The ability to redefine or modify the system's objective or missions

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[228] Masoud Zamani, 'How Meaningful Is "Meaningful Human Control" Anyway? Cracking the Code on Autonomous Weapons and Human Judgment' (Articles of War, Lieber Institute for Law & Warfare, 26 March 2025) https://lieber.westpoint.edu/how-meaningful-is-meaningful-human-control-laws-regulation/

[229] Article 36, *Killer Robots: UK Government Policy on Fully Autonomous Weapons* (April 2013) https://article36.org/wp-content/uploads/2013/04/Policy_Paper1.pdf

[230] United Nations, *Report of the 2014 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS)* UN Doc G14/048/96 (2014), para. 20 https://documents.un.org/doc/undoc/gen/g14/048/96/pdf/g1404896.pdf

[231] Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, *Draft Report of the 2023 Session* UN Doc CCW/GGE.1/2023/CRP.2 (12 May 2023) https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2023)/CCW_GGE1_2023_CRP.2_12_May.pdf

- The ability to interrupt or deactivate the system".[232]

These developments signal a transformation of the notion of MHC from policy aspirations to potential regulatory benchmarks for future international regimes.

International organizations and human rights bodies have similarly endorsed the importance of maintaining human involvement in decisions regarding the use of lethal force. The International Committee of the Red Cross has consistently argued that human control must be preserved, in particular with regard to the "critical" functions of AWS, specifically target selection and engagement.[233] Other actors advocate for a broader understanding of the concept, arguing that MHC must cover the entire lifecycle of the system, from the design to testing and finally to deployment of the weapon.[234]

The importance of MHC has also been strongly emphasized within the human rights discourse. In 2016, the UN Special Rapporteurs Kiai and Heyns argued in their joint report that AWS requiring no meaningful human control should be prohibited, particularly when their deployment risks undermining fundamental rights protections.[235] Their report underlined the growing concern that fully autonomous decision-making in armed conflict may be incompatible with the requirements of legality, accountability, and human dignity embedded within IHRL. Moreover, Human Rights Watch and the International Human Rights Clinic, supported by a broad coalition of states and civil society actors, have consistently advocated for the adoption of a legally binding international instrument prohibiting or strictly regulating AWS that operate without MHC.[236]

Despite the convergence regarding the importance of preserving human agency, international discussions reveal significant divergence in terminology and conceptual framing. Different states and institutions employ alternative expressions such as "human supervision", "human judgment", and "human command". For instance, the US uses "appropriate human judgment" in its military doctrine to emphasize the need for human judgment appropriate to the operational context rather than adopting the terminology of MHC. These terminological differences are not

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[232] UN Secretary-General, *Lethal Autonomous Weapon Systems* UN Doc A/79/88 (1 July 2024), para. 13 https://docs-library.unoda.org/General_Assembly_First_Committee_-Seventy-Ninth_session_(2024)/A-79-88-LAWS.pdf

[233] International Committee of the Red Cross, *Autonomous Weapon Systems: Implications of Increasing Autonomy in the Critical Functions of Weapons* (ICRC 2017), p. 7 https://icrcndresourcecentre.org/wp-content/uploads/2017/11/4283_002_Autonomus-Weapon-Systems_WEB.pdf

[234] UNSG, *Lethal Autonomous Weapon Systems* (2024), p. 38

[235] Maina Kiai and Christof Heyns, *Joint Report of the Special Rapporteur on the Rights to Freedom of Peaceful Assembly and of Association and the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions on the Proper Management of Assemblies,* UN Doc. A/HRC/31/66 (4 February 2016), para. 67(f) https://digitallibrary.un.org/record/831673

[236] HRW and IHRC, *A Hazard to Human Rights* (n 157), p. 6 https://www.hrw.org/report/2025/04/28/a-hazard-to-human-rights/autonomous-weapons-systems-and-digital-decision-making

merely semantic; they reflect deeper disagreements regarding the level, timing, and quality of human involvement required to ensure lawful operations.[237]

Academic discussions further illustrate the conceptual complexity of the issue. Horowitz and Scharre provided some of the earliest attempts to codify the constituent elements of MHC, identifying informed decision-making, sufficient information, and effective technical oversight. In their view, this framework serves a tripartite purpose: ensuring legal accountability, preserving moral responsibility, and maintaining the practical controllability of AWS.[238] However, these approaches have been criticized for adopting an overly narrow and operational understanding of control, insufficiently attentive to broader institutional, organizational, and governance dimensions.[239] Roff and Moyes conceptualize MHC through a tripartite temporal lens covering the pre-conflict (*ante-bellum*), during the hostilities (*in bello*), and after the conflict (*post-bellum*). According to them, MHC functions as a bridge between the necessity of responsible system design and the requirement of accountability. Thus, the third layer of accountability serves as a fail-safe that is activated when the structural and operational safeguards of the preceding stages fail to maintain human agency.[240]

Recent scholarship has, therefore, sought to develop more comprehensive models, emphasizing not only direct operational supervision but also broader requirements of traceability, predictability, and systemic accountability.[241] Santoni de Sio and Van den Hoven argue that MHC is achieved when AWS satisfy the conditions of tracking and tracing. The former ensures that the system's operations are sensitive to human moral reasoning and the environmental conditions in which the system operates. The latter establishes a nexus of responsibility, requiring that the system's actions are the product of an informed human understanding. This dual-layered approach tries to bridge the gap between technical performance and moral accountability.[242]

4.1.3 Limitations of Meaningful Human Control

Despite its growing prominence in legal and political discussions, MHC remains a contested and structurally limited concept. MHC is frequently considered to be capable of preserving human agency and accountability in the context of autonomous systems.[243] However, the concept does

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[237] Perišić (n. 1) p. 447
[238] Michael C. Horowitz and Paul Scharre, *Meaningful Human Control in Weapon Systems: A Primer* (Center for a New American Security 2015), p. 4 https://s3.us-east-1.amazonaws.com/files.cnas.org/documents/Ethical-Autonomy-Working-Paper_031315.pdf
[239] Ilse Verdiesen, Filippo Santoni de Sio and Virginia Dignum, 'Accountability and Control Over Autonomous Weapon Systems: A Framework for Comprehensive Human Oversight' (2021) 31(1) Minds and Machines, p. 148 https://doi.org/10.1007/s11023-020-09532-9
[240] Ibid. p. 138
[241] Ibid. p. 148
[242] Filippo Santoni de Sio and Jeroen van den Hoven, 'Meaningful Human Control over Autonomous Systems: A Philosophical Account' (2018) *Frontiers in Robotics and AI*, p. 1 https://doi.org/10.3389/frobt.2018.00015
[243] Calvert (n. 224), p. 27

not, by itself, solve deeper legal and ethical concerns attached to these new technologies used in warfare. Nonetheless, it can function as a framework through which such concerns may be addressed, provided that sufficiently clearer standards are attached to it.

One of the principal limitations of MHC lies in its conceptual indeterminacy. As highlighted in the previous section, despite this concept being increasingly used in international discussions, there is no consensus regarding the threshold of control required to satisfy this standard. States and scholars diverge on whether control to be "meaningful" requires direct human intervention in every targeting decision or whether broader forms of supervision and system design are enough to respect this criteria.[244] Thus, this notion risks becoming excessively flexible, allowing states to invoke MHC rhetorically while maintaining a high degree of autonomy in practice. The absence of precise criteria may therefore weaken its regulatory value and permit divergent interpretation of what constitutes meaningful control over AI-based weapons.

Another limitation of MHC is that it can create operational and legal complexities. By definition, AWS are developed to operate autonomously at speeds and in environments where continuous human supervision is impracticable. In highly dynamic combat situations, meaningful intervention may be technically impossible once the system has been activated. For instance, in defensive systems operating within collapsed timeframes, human operators may formally authorize the deployment of the system; however, after activation, it is not possible to reassess or interrupt the attack.[245] Therefore, the existence of theoretical human involvement does not necessarily guarantee substantive human control over the actual use of force.

Scholars have also emphasized the cognitive limitations affecting human interaction with complex computational systems. Schwarz argues that the possibility of retaining genuine MHC is constrained by the nature of the interaction between human and machine.[246] Humans frequently rely on automatic rather than deliberative reasoning when interacting with advanced technological systems, particularly under conditions of information overload and stress. This tendency may produce the so-called "automation bias", which is the inclination to place excessive trust in AI-generated outputs while disregarding contradictory information.[247] In practice, operators supervising AWS may become increasingly dependent on algorithmic outputs

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[244] Masoud Zamani, 'How Meaningful Is "Meaningful Human Control" Anyway? Cracking the Code on Autonomous Weapons and Human Judgment' (Articles of War, Lieber Institute for Law & Warfare, 26 March 2025) https://lieber.westpoint.edu/how-meaningful-is-meaningful-human-control-laws-regulation/

[245] Bode and Watts (n. 20) 3

[246] Elke Schwarz, 'The (Im)Possibility of Meaningful Human Control for Lethal Autonomous Weapon Systems' (Humanitarian Law & Policy Blog, 29 August 2018) https://blogs.icrc.org/law-and-policy/2018/08/29/im-possibility-meaningful-human-control-lethal-autonomous-weapon-systems/

[247] Noel Sharkey, *Guidelines for the Human Control of Weapons Systems* (ICRAC Working Paper No. 3, CCW GGE April 2018, International Committee for Robot Arms Control 2018) https://www.icrac.net/icrac-working-paper-3-ccw-gge-april-2018-guidelines-for-the-human-control-of-weapons-systems/

without critically evaluating them. Even where humans formally remain "in the loop", their role risks becoming largely passive or confirmatory rather than genuinely deliberative. Under such conditions, the preservation of human agency becomes questionable.

AWS relies on large quantities of data to identify patterns and generate operational outcomes. Nonetheless, these algorithmic systems can only process information that is capable of being translated into data (contextual and culturally contingent elements may escape algorithmic interpretation). In warfare, decisions generated through incomplete or biased datasets may lead to distorted assessments and, consequently, unlawful attacks on civilians. This issue relates to the already presented "black-box" problem; even if humans supervise the system, their inability to meaningfully evaluate the basis of algorithmic decisions may be severely limited by the opacity of the technology itself.[248] MHC presupposes not only formal authority over the system but also sufficient understanding of its functioning and probable effects. Without transparency, human involvement becomes superficial, thereby undermining the rationale upon which MHC is based.

Temporal limitations further reduce the practical feasibility of meaningful human intervention. AWS are developed to quickly process information and react faster than human operators, particularly in environments characterized by rapidly evolving threats.[249] In the name of military necessity, states supporting increased autonomy tend to emphasize that reducing human involvement may enhance operational effectiveness and improve compliance with IHL by minimizing human error. For example, the US has argued that there is no universally appropriate level of human judgment applicable to all operational contexts and that certain functions may be performed more effectively by machines than by humans. Similarly, Russia has maintained that highly automated systems may improve targeting precision and reduce unintended civilian casualties.[250]

These arguments reflect the positions of supporters of AWS that claim autonomy may contribute to more "humane" warfare by increasing accuracy, reducing emotional or irrational human behavior, and protecting military personnel. States developing AWS underscore the capacity of these systems to process large quantities of information, maintain operational endurance, and function in dangerous environments without exposing soldiers to risks. Moreover, some scholars argue that these weapons may enhance situational awareness and improve distinction between civilians and combatants. From this perspective, reducing direct human control is viewed as improving humanitarian protection.[251]

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[248] Schwarz (n. 246)
[249] Ibid.
[250] Anna-Katharina Ferl, 'Imagining Meaningful Human Control: Autonomous Weapons and the (De-)Legitimisation of Future Warfare' (2024) 38(1) *Global Society*, p. 147 https://doi.org/10.1080/13600826.2023.2233004
[251] Vivek Sehrawat, 'Autonomous Weapon Systems and Meaningful Human Control' (2025) 33 *International Journal of Law and Information Technology* https://doi.org/10.1093/ijlit/eaaf007

Nevertheless, these claims remain highly contested. These narratives emphasizing efficiency and precision frequently prioritize military necessity over broader humanitarian considerations. Technologically advanced states and other entities that support the proliferation of AWS by stating that these systems may reduce casualties often focus primarily on protecting their soldiers rather than civilians affected by the use of force. Moreover, the assumption that algorithmic decision-making is inherently more objective or reliable than human judgment overlooks the possibility of systemic errors, biased datasets, and unpredictable interactions between autonomous systems operating in complex environments. Sharkey warns that the proliferation of autonomous weapons may generate increasingly unpredictable forms of warfare. In such circumstances, MHC may become progressively more difficult to preserve in practice[252]

For these reasons, MHC should not be understood as a satisfactory solution to the legal and ethical challenges posed by AWS. The concept cannot, on its own, remove the risks associated with autonomy in the use of force, nor can it fully resolve questions of accountability and civilian protection. However, MHC retains important value as a legal and normative lens through which the legality of AWS may be assessed. Properly developed, it may serve as a basis for articulating safeguards intended to preserve compliance with IHL and IHRL while ensuring that the protection of victims remains central within future regulatory frameworks governing AWS.

4.2 Meaningful Human Control from a victim centered perspective

Discussions surrounding MHC are often focused on questions of military necessity and legal accountability. However, from the perspective of this thesis, the significance of MHC lies primarily in its potential to function as a victim-centered framework capable of preserving human agency and safeguarding the rights of individuals affected by the deployment of AWS. As demonstrated throughout the previous chapter, the increasing autonomy of weapons systems weakens the practical protection afforded to victims under both IHL and IHRL by obscuring responsibility, consequently undermining access to remedies.

In its 2024 report on LAWS, the UN Secretary-General noted that several states stressed the necessity of maintaining human control at all stages of a system's lifecycle in order to ensure compliance with IHL and maintain responsibility for the consequences of military actions.[253] Similarly, the GGE concluded that states must ensure respect for international law "throughout the life cycle of weapon systems based on emerging technologies in the area of lethal autonomous weapons systems".[254] These positions demonstrate a growing recognition of the fact that legal implications of AWS must extend to the broader process of design, development, testing, deployment, and supervision. This is particularly important for a victim-centered perspective since harm caused by AWS does not arise exclusively from operational failures

[252] Sharkey (n. 247), p. 29
[253] UNSG, *Lethal Autonomous Weapon Systems* (2024), p. 6
[254] Ibid p. 56

during combat but may originate at earlier stages of the system's lifecycle. The ICRC confirmed this approach, pointing out the importance of continuous human responsibility to safeguard civilians from unlawful targeting, indiscriminate attacks, and accountability gaps.[255]

Several nations explicitly linked this broader conception of MHC to protection of civilians and preservation of accountability. For instance, many states adopt a human-centered perspective, arguing that compliance with IHL requires humans to make and remain accountable for decisions involving AWS while retaining the ability to intervene, interrupt, or deactivate these machines.[256] From a victim-centered perspective, the existence of traceable human responsibility is crucial for the recognition and protection of victims. As demonstrated in Chapter 3, victims' access to justice, accountability, and reparations may be severely undermined where the causal chain leading to harm is obscured by algorithmic opacity or distributed decision-making structures. MHC attempts to counter this tendency by preserving a human chain of accountability throughout the lifecycle of AWS.

A victim-centered conception of MHC must be understood as encompassing more than technical supervision over weapons systems. It requires the preservation of human judgment, moral agency, and institutional responsibility in ways capable of ensuring that civilians remain protected subjects of law rather than passive objects of technological processes. Human control becomes meaningful precisely because it seeks to preserve the conditions necessary for the effective application of IHL and IHRL protections, including the possibility of identifying violations, attributing responsibility, and guaranteeing victims' rights after unlawful attacks occur.

The following sections will analyze MHC through the different stages of the lifecycle of AWS to evaluate its potential to safeguard victims' rights in the context of increasingly autonomous warfare.

4.2.1 Preventive safeguards (ex ante)

One of the fundamental objectives of IHL is to prevent civilians from becoming victims of unlawful attacks in the first place. Therefore, MHC should be applied also at the earlier stages of the lifecycle of AWS (design, development, testing and authorization for deployment). Preventive safeguards are important because, once harm occurs, accountability and reparations may not fully remedy the irreversible consequences suffered by victims.

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[255] International Committee of the Red Cross, *Expert Meeting: Autonomous Weapon Systems: Implications of Increasing Autonomy in the Critical Functions of Weapons* (Versoix, Switzerland, 15–16 March 2016), p. 84 https://icrcndresourcecentre.org/wp-content/uploads/2017/11/4283_002_Autonomus-Weapon-Systems_WEB.pdf

[256] UNSG, *Lethal Autonomous Weapon Systems* (2024), p. 59

The UN Secretary-General noted that several states emphasized the importance of conducting risk assessments and implementing mitigation measures before deployment in order to ensure compliance with international law.[257] Human control may be effectively initiated during the developmental phase through the strategic design and algorithmic programming of the system. At this stage, developers must ensure that the system is architecturally capable of adhering to IHL under its intended operational conditions. This necessitates rigorous verification of the system's predictability and reliability through testing in realistic conditions. Thus, legal and tactical constraints (such as temporal and spatial limitations or requirements for active human supervision) must be hard-coded into the system's operational parameters.[258]

These safeguards are essential because unpredictable or insufficiently tested systems may expose civilians to risk; therefore, AWS must be reliable and predictable in real-world conditions.[259] A key preventive mechanism is the obligation to conduct legal reviews codified by Article 36 of AP I. These reviews require states to assess whether new weapons can be used consistently with international law before they are adopted or deployed. In the context of AWS, Article 36 reviews function as an important safeguard aimed at identifying risks to civilians before harm occurs.[260] Ultimately, *ex ante* forms of meaningful human control seek to reduce the likelihood that civilians will suffer unlawful harm while preserving the conditions necessary for future accountability if violations nevertheless occur.

4.2.2 Operational safeguards (during use)

MHC must remain effective also during the actual use of force (during deployment and operation) to reduce the risk of unlawful attack against civilians. International discussions emphasize that human operators must retain the ability to supervise and intervene during the deployment of AWS. They must be capable of monitoring the reliability of autonomous weapons during the active phase of combat and be able to modify mission parameters. Furthermore, military personnel must remain able to exercise judgment concerning compliance with the principles of distinction, proportionality, and precaution. These safeguards are important for victims because they seek to ensure that decisions involving the use of lethal force are not delegated entirely to AWS operating without MHC.[261]

In this second phase of the lifecycle, human control is characterized by the commander's ability to approach the outputs of the first phase and apply them to the specific contextual

[257] UNSG, *Lethal Autonomous Weapon Systems* (2024), p. 17
[258] Neil Davison, 'Autonomous Weapon Systems under International Humanitarian Law' in *UNODA Occasional Papers No. 30* (United Nations Office for Disarmament Affairs, November 2017), p. 12 https://doi.org/10.18356/29a571ba-en
[259] International Committee of the Red Cross, *Expert Meeting: Autonomous Weapon Systems: Implications of Increasing Autonomy in the Critical Functions of Weapons* (Versoix, Switzerland, 15–16 March 2016), p. 84 https://icrcndresourcecentre.org/wp-content/uploads/2017/11/4283_002_Autonomus-Weapon-Systems_WEB.pdf
[260] Article 36 AP I
[261] UNSG, *Lethal Autonomous Weapon Systems* (2024), p. 84

environment.[262] The commander's decision to activate an AWS must be based on sufficient understanding of the weapon's functions in the existing circumstances, including adequate situational awareness regarding the operational environment and the potential risks posed to civilians.[263] Civilian protection depends heavily upon contextual judgment. In a rapidly changing environment such as a warzone, MHC seeks to preserve the possibility of modifying or aborting attacks where the risk to civilians becomes excessive. Moyes observed that the less predictable and transparent a weapon is, and the more dynamic the operational context becomes, the more difficult it is for commanders to meaningfully anticipate outcomes.[264]

Thus, these operational safeguards aim to ensure that human judgment remains central also during armed conduct. If human oversight is preserved in real-time, MHC can function as a protective mechanism intended to minimize unlawful harm to civilians and reduce the risk of victimization.

4.2.3 Ex post safeguards (after harm)

The relevance of MHC extends beyond the moment in which force is deployed. From a victim-centered perspective, MHC has an important function in preserving the possibility of reconstructing how an attack occurred, identifying the actors involved, and ensuring that violations of international law correspond to legal consequences.[265] Without these safeguards, victims may be deprived of access to justice and remedies despite the existence of substantive legal protections.

As described in the previous chapters, the "black-box" design of AWS risks undermining the ability of investigators and courts to determine how targeting decisions were reached and whether the attack complied with IHL principles.[266] In this context, *ex-post* safeguards become essential to preserve accountability structures after the deployment of lethal force. A first requirement concerns traceability and record-keeping mechanisms. Human control presupposes that sufficient information concerning the operation of the system is preserved throughout the lifecycle of the weapon.[267] This includes data regarding the targeting process, operational parameters, mission constraints, algorithmic outputs, level of human supervision, and decisions taken by commanders and operators. These records are fundamental for the reconstruction of events leading to the harm. Without reliable documentation, victims may face evidentiary barriers when attempting to establish responsibility for unlawful attacks.

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[262] Richard Moyes, *Meaningful Human Control, Artificial Intelligence and Autonomous Weapons* (Article 36, April 2016), p. 4 https://article36.org/wp-content/uploads/2016/04/MHC-AI-and-AWS-FINAL.pdf
[263] Davison (n. 258), p. 13
[264] Moyes, *Meaningful Human Control* (n. 262)
[265] Ibid. p. 5
[266] Kwik (n. 48) 10
[267] Dan Kuwali, 'Accountability for Autonomous Lethality - the Raoul Wallenberg Institute of Human Rights and Humanitarian Law' (*The Raoul Wallenberg Institute of Human Rights and Humanitarian Law,* 27 January 2026) https://rwi.lu.se/blog/accountability-for-autonomous-lethality/

Moreover, human operators must remain capable of explaining, to a legally sufficient degree, the basis upon which the system selected and engaged a target. Explainability does not necessarily mean full technical transparency; however, it requires that the operation of AWS remain sufficiently understandable to permit MHC and legal review.[268]
Ex-post safeguards are also directly connected to the duty to investigate potential violations of IHL and IHRL. States are under an obligation to conduct prompt, independent, and effective investigations in case of allegations of unlawful attacks resulting in civilian harm. Nonetheless, such investigations can only be effective if relevant evidence remains accessible and intelligible.[269] MHC serves to preserve the possibility of attributing conduct to identifiable actors within the chain of command and prevent the responsibility from being obscured behind AI-led processes.

In this regard, MHC contributes to preserving victims' right to truth. Victims and their families are entitled to know the circumstances in which harm occurred, including the reasons underlying the attack and the actors responsible for authorizing or deploying the system.[270] *Ex-post* safeguards seek to prevent accountability gaps by ensuring that the use of force remains legally and factually reconstructable after the attack has taken place. Furthermore, MHC functions as a structural mechanism aimed at preserving the legal conditions necessary for accountability, investigations, and reparative processes for victims.

4.2.4 Victim-centered safeguards

The mechanisms analyzed in the previous sections demonstrate how MHC may contribute to reducing humanitarian and legal risks associated with AWS. Nonetheless, current international discussions concerning MHC remain predominantly state-centered and military-oriented, focusing primarily on military effectiveness rather than on the concrete position of victims affected by the deployment of AWS. Additionally, civilian protection is presented as a consequence of enhanced military performance rather than as an autonomous normative objective. Consequently, experiences and rights of victims take a backseat to military considerations and strategic gains. This approach may inadequately address the broader humanitarian consequences of AWS, including the psychological trauma caused by persistent surveillance, unpredictability, and the fear generated by systems capable of operating through algorithms without human involvement in decisions regarding the use of force.[271]

A victim-centered perspective requires shifting the analytical focus from the technological capabilities of AWS and the operational interests of states toward the protection of individuals affected by armed conflict. In this context, a victim-centered approach may be understood as one

[268] Stop Killer Robots, 'Problems with Autonomous Weapons' (n. 38)
[269] Bantekas and Oette (n. 94) 373-374
[270] Bassiouni (n. 121), p. 257
[271] Andre Kosmo Berntsen, Cyrill Kischel, and Nick Husmann, 'Autonomous Weapons and Soldier Morale' (The Defence Horizon Journal, 15 October 2025) https://tdhj.org/blog/post/autonomous-weapons-morale/

that prioritizes the rights, dignity, safety, and lived experiences of persons harmed or placed at risk by the deployment of AWS.[272] It evaluates legal and regulatory frameworks not exclusively according to their military effectiveness or formal legality but according to whether they effectively preserve the protections that international law seeks to guarantee to civilians and victims of violations.

From this perspective, the adequacy of MHC should be assessed according to whether it meaningfully contributes to the protection of victims' rights. Human control should preserve civilian protection by reducing the likelihood of unlawful attacks and ensuring that contextual human judgment remains central to targeting decisions. It should avoid accountability gaps by maintaining identifiable chains of human responsibility and preventing harmful conduct from disappearing within opaque technological systems. Furthermore, MHC should contribute to preserving victims' access to remedies by ensuring that sufficient information, traceability, and explainability remain available after harm occurs. Human control is also necessary for the preservation of human dignity, since decisions involving the deprivation of life need to involve human moral agency. Finally, MHC must ensure that victims do not become invisible due to technological opacity, particularly where the complexity of autonomous decision-making risks obscuring the causes of harm and the responsible actors.

It must be highlighted that a victim-centered perspective reveals the limits of relying exclusively on MHC as a regulatory solution. Human involvement alone cannot fully solve the legal and humanitarian challenges caused by AWS. MHC constitutes an important safeguard for victims but not a complete legal framework in itself. Therefore, broader and more integrated regulatory approaches are necessary to address accountability issues and victim protection.

4.3 Toward and integrated legal framework

Currently, MHC is largely situated within the domain of soft law, non-binding international recommendations, and policy discussions. In fact, there is no universally accepted legally binding international instrument focusing on regulating AWS or defining detailed legal obligations concerning the degree of human control required over these systems.

Nonetheless, over the last decade, international discussions have progressively consolidated the view that the preservation of human control over the use of force is a fundamental requirement to ensure compliance with international law.[273] The ICRC and the UN Secretary-General emphasized the urgency of adopting international rules governing AWS. In their 2023 joint call, they stated that "human control must be retained in life and death decisions. […] Machines with the power and discretion to take lives without human involvement should be prohibited by

[272] United Nations, 'Victims' Rights First' https://www.un.org/en/victims-rights-first
[273] Davison (n. 258), p. 11

international law".[274] The statement further highlighted that, although existing IHL continues to apply to AWS, the absence of a specific legal instrument allows states to adopt divergent interpretations regarding the legality of these systems and the extent of acceptable autonomy.

The growing support for regulation has also been reflected in recent UN discussions. The 2024 report of the Secretary-General demonstrates that a considerable number of states support the development of stronger normative frameworks governing AWS. Many delegations (such as Bulgaria, Denmark, France, Germany, Italy, Luxembourg, and Norway) endorsed a "two-tier" approach, according to which AWS incapable of operating within the parameters of international law would be subject to a categorical ban, whereas systems capable of legal compliance would be managed through stringent regulations.[275]

At the same time, other states maintain that existing IHL is already sufficient to address emerging military technologies.[276] Certain technologically advanced military powers continue to resist the creation of new binding obligations, emphasizing the military utility, precision, and strategic advantages associated with autonomous weapons. In fact, several states have already deployed these systems and continue to do so despite international discussions.[277]

From a victim-centered perspective, AWS introduces and amplifies risks. Thus, the effective protection of victims depends not only on the existence of human control during targeting decisions but also on the development of legal safeguards capable of ensuring accountability and access to remedies. In order to guarantee justice for victims, abstract assurances that the systems operate within legal parameters are not sufficient. International law should be able to guarantee mechanisms capable of identifying responsible actors, preserving evidence, enabling investigations, and guaranteeing reparations.

The future regulation of AWS requires a comprehensive and integrated legal approach that moves beyond purely military and technological considerations to include substantive civilian and victims' rights protection.[278] MHC constitutes an important tool capable of preserving human

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[274] United Nations and International Committee of the Red Cross, 'Joint Call by the United Nations Secretary-General and the President of the International Committee of the Red Cross for States to Establish New Prohibitions and Restrictions on Autonomous Weapon Systems' (ICRC, 5 October 2023) https://www.icrc.org/en/document/joint-call-un-and-icrc-establish-prohibitions-and-restrictions-autonomous-weapons-systems

[275] Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, *Working Paper Submitted by Bulgaria, Denmark, France, Germany, Italy, Luxembourg and Norway,* UN Doc CCW/GGE.1/2024/WP.3 (1 March 2024) https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2024)/CCW-GGE.1-2024-WP.3.pdf

[276] UNSG, *Lethal Autonomous Weapon Systems* (2024), p. 72

[277] Anna-Katharina Ferl, 'Imagining Meaningful Human Control: Autonomous Weapons and the (De-)Legitimisation of Future Warfare' (2024) 38(1) *Global Society*, p. 147 https://doi.org/10.1080/13600826.2023.2233004

[278] International Committee of the Red Cross, 'What You Need to Know about Autonomous Weapons' (ICRC, 26 July 2022) https://www.icrc.org/en/document/what-you-need-know-about-autonomous-weapons

responsibility and reducing accountability gaps, but it is insufficient alone. Effective regulation must combine clear legal prohibitions and restrictions, strict weapons review procedures, transparency obligations, accountability mechanisms, and protections aimed at preserving victims' rights. For this purpose, the UN Secretary-General calls "for the conclusion, by 2026, of a legally binding instrument to prohibit lethal autonomous weapons systems that function without human control or oversight and that cannot be used in compliance with international humanitarian law, and to regulate all other types of autonomous weapons systems".[279]

[279] UNSG, *Lethal Autonomous Weapon Systems* (2024), p. 90

CONCLUSION

The development and deployment of AI-powered AWS marked the beginning of a new era of warfare. The increasing autonomy of these systems poses a number of challenges in the legal sphere; in particular, they deteriorate the human-centered foundations upon which IHL and IHRL are built, raising concerns regarding compliance, accountability, and the effective protection of individuals harmed during armed conflict.

This thesis has examined how the use of AWS affects the protection of victims under IHL and IHRL and whether the requirement of MHC can function as a safeguard for victims' rights. It has demonstrated how AWS impact the core principles of IHL (distinction, proportionality, and precaution), which require highly contextual and qualitative assessments that have traditionally depended on human evaluation. The use of AWS in dynamic and populated settings increases the risk of unlawful harm to civilians and civilian objects. The unpredictability and opacity of these systems further complicate the ability to foresee and limit the effects of attacks. Therefore, ensuring compliance of fully autonomous systems with IHL becomes increasingly difficult in practice, thereby weakening the effective protection afforded to victims in armed conflict. Furthermore, the deployment of AWS creates important challenges also under the IHRL regime, particularly regarding the protection of the right to life and the procedural obligations owed to victims and their families. According to the prohibition of arbitrary deprivation of life, lethal force must remain necessary, proportionate, and subject to accountability. However, due to the fact that AWS are capable of independently selecting and engaging with a target, identifying who bears responsibility becomes more complex. The consequent phenomenon of diffusion of responsibility among commanders, operators, programmers, and manufacturers creates accountability gaps that undermine effective investigations, access to justice, and the possibility for victims of obtaining remedies and reparations.

A central finding of this thesis is that the protection afforded to victims becomes increasingly fragile as human involvement in the use of lethal force decreases. Existing international legal frameworks were created on the basic assumption that humans are responsible for decisions concerning life and death. This assumption is undermined by the increasing autonomy of these systems, weakening the practical enforcement of legal protections. In this context, the requirement of MHC emerged in international debates as an important safeguard capable of preserving human judgment, accountability, and legal oversight in the use of force. Nevertheless, as pointed out, MHC alone cannot solve all the legal and ethical challenges surrounding AWS, particularly given the absence of a universally accepted definition and the difficulties in determining what degree of human involvement is sufficient in practice. However, it can function as a victim-centered framework with the purpose of upholding human agency and safeguarding the rights of victims. By maintaining meaningful human involvement throughout the whole life cycle of an AWS (from the design to the deployment), MHC may contribute to

preserving the conditions necessary for accountability, investigations, and, most importantly, access to effective remedies and reparations.

Finally, multiple actors on the global stage (such as states, international organizations, and scholars) are advocating for the adoption of a legally binding instrument capable of regulating AWS and ensuring effective accountability. The protection of individuals must be at the forefront of these discussions to ensure that future regulations prioritize human rights rather than military necessity and political interests. Technological advancement in warfare cannot erode the fundamental notions of human dignity, accountability, and the essential protections guaranteed under international law for victims of AWS in armed conflict.

Bibliography

ACADEMIC LITERATURE

Ali A. and Ramamurthy S., 'Humanity at the Crossroads: Human Rights Challenges in the Age of Lethal Autonomous Weapon Systems' (2025) 53(1) International Journal of Legal Information

Akkuş B., 'An Assessment of the Acceptance of Meaningful Human Control as a Norm of International Law in Armed Conflicts Using Artificial Intelligence' (2023) 81(3) *Journal of Ankara Bar Association*

Amoroso D. and Tamburrini G., 'Autonomous Weapons Systems and Meaningful Human Control: Ethical and Legal Issues' (2020) 1 *Current Robotics Reports* https://www.researchgate.net/publication/343844421_Autonomous_Weapons_Systems_and_Meaningful_Human_Control_Ethical_and_Legal_Issues

Arkin R., ' The Case for Ethical Autonomy in Unmanned Systems' (2010) Journal of Military Ethics 9(4) https://repository.gatech.edu/server/api/core/bitstreams/62b98c87-e7af-4b1c-80a3-6b5157be079e/content

Asaro P., 'Jus Nascendi, Robotic Weapons and the Martens Clause' in Ryan Calo, Michael A. Froomkin, and Ian Kerr (eds.), Robot Law (Edward Elgar Publishing 2016) https://peterasaro.org/writing/Asaro%20Jus%20Nascendi%20PROOF.pdf

Bantekas I. and Oette L., International Human Rights Law and Practice (4th edn, Cambridge University Press 2024)

Bassiouni M.C, 'International Recognition of Victims' Rights' (2006) 6(2) Human Rights Law Review

Bhat PI, 'Idea and Methods of Legal Research' (Oxford University Press 2020)

Bode I and Watts T.F.A., 'Loitering Munitions and Unpredictability Autonomy in Weapon Systems and Challenges to Human Control' (2023) https://findresearcher.sdu.dk/ws/portalfiles/portal/231643063/Loitering_Munitions_Unpredictability_WEB.pdf

Calvert S.C., 'Principles and Framework for the Operationalisation of Meaningful Human Control Over Autonomous Systems' (2025) 31(5) Science and Engineering Ethics https://doi.org/10.1007/s11948-025-00554-z

Cantú Rivera H., 'Article 8 - The Right to an Effective Remedy' in Gudmundur Alfredsson and Asbjørn Eide (eds.), The Universal Declaration of Human Rights: A Common Standard of Achievement (Martinus Nijhoff/Brill 2023) https://doi.org/10.1163/9789004365148_010
Chirwa D., 'The Doctrine of State Responsibility as a Potential Means of Holding Private Actors Accountable for Human Rights' (2004) 5 Melbourne Journal of International Law

Ciampi A., Fiskatoris T. and Viswanath R., 'International Criminal Law' in The Routledge Handbook of International Criminal Law (Routledge 2024)

Crawford E. and Pert A., International Humanitarian Law (3rd edn., Cambridge University Press 2024)

Dagras M., 'The Protection of Victims under International Criminal Law' (SSRN Working Paper, 19 August 2021)

David E., 'Primary and Secondary Rules' in James Crawford, Alain Pellet, and Simon Olleson (eds.), The Law of International Responsibility (Oxford University Press 2010) https://doi.org/10.1093/law/9780199296972.003.0003

De Schutter O., 'Derogations in Time of Public Emergency' in Daniel Moeckli, Sangeeta Shah and Sandesh Sivakumaran (eds), International Human Rights Law (2nd edn, Cambridge University Press 2019)

De Schutter O., International Human Rights Law (3rd edn, Cambridge University Press 2019)

Dorsey J., 'The Erosion of Human(E) Judgement in Targeting? Quantification Logics, AI-Enabled Decision Support Systems and Proportionality Assessments in IHL' (2026) International Review of the Red Cross https://www.cambridge.org/core/journals/international-review-of-the-red-cross/article/erosion-of-humane-judgement-in-targeting-quantification-logics-aienabled-decision-support-systems-and-proportionality-assessments-in-ihl/31024C3473211FB84FD535BC815ADC03

Eser A., 'Individual Criminal Responsibility' in Antonio Cassese, Paola Gaeta, and John R. W. D. Jones (eds.), The Rome Statute of the International Criminal Court: A Commentary (Oxford University Press 2002)

Etzioni A., 'Pros and Cons of Autonomous Weapons Systems (with Oren Etzioni)' (2018) 11 Library of Public Public Administration, Springer https://link.springer.com/chapter/10.1007%2F978-3-319-69623-2_16

Ferl A., ‘Imagining Meaningful Human Control: Autonomous Weapons and the (De-)Legitimisation of Future Warfare’ (2024) 38(1) *Global Society* https://doi.org/10.1080/13600826.2023.2233004

Fernández de Casadevante C., ‘Sovereignty and Human Rights’ (2010) Max Planck UNYB 14

Findley B, ‘Why Racial Bias is Prevalent in Facial Recognition Technology’ (Harvard Journal of Law & Technology Digest, 3 November 2020) https://jolt.law.harvard.edu/digest/why-racial-bias-is-prevalent-in-facial-recognition-technology

Furuya S., Correa C., and Sandoval C., ‘The Right to Reparation for Victims of Armed Conflict: The Intertwined Development of Substantive and Procedural Aspects’ in Shinya Furuya, Carlos Correa, and Clara Sandoval (eds.), Reparation for Victims of Armed Conflict (Cambridge University Press 2020)

Geiss R. and Lahmann H., ‘Autonomous Weapons Systems: A Paradigm Shift for the Law of Armed Conflict? (2017) in J.D. Ohlin (ed.), Research Handbook on Remote Warfare (Edward Elgar Publishing, 2019)

Gallen J., ‘Reparations’ in Transitional Justice and the Historical Abuses of Church and State (Cambridge University Press 2023)

Gevorgyan M., ‘Crossing Boundaries: Autonomous Weapon Systems and the Challenge of IHL Compliance’ (2023) 2023 Int'l J L Ethics Tech

Gorski S., ‘Individuals in International Law’ in Rüdiger Wolfrum (ed.), *Max Planck Encyclopedia of Public International Law* (Oxford University Press 2013) https://opil.ouplaw.com/display/10.1093/law:epil/9780199231690/law-9780199231690-e829

Gunawan Y., Aulawi M.H., Anggriawan R. and Putro T.A., ‘Command Responsibility of Autonomous Weapons under International Humanitarian Law’ (2022) 8(1) Cogent Social Sciences https://doi.org/10.1080/23311886.2022.2139906

Heyns C., ‘Autonomous Weapons Systems: Living a Dignified Life and Dying a Dignified Death’ (2016) In N. Bhuta, S. Beck, R. Geiβ, H.-Y. Liu, & C. Kreβ (Eds.), Autonomous Weapons Systems: Law, Ethics, Policy

Husniaux A., ‘Afterword: Looking Forward – A Research Agenda for NATO’ in Andrew P. Williams and Paul D. Scharre (eds.), Autonomous Systems: Issues for Defence Policymakers (Headquarters Supreme Allied Commander Transformation 2015)

Jain A.G., ‘Autonomous Weapon Systems, Errors and Breaches of International Humanitarian Law’ (2023) 21(5) Journal of International Criminal Justice https://doi.org/10.1093/jicj/mqad043

Keeley T., ‘Auditable Policies for Autonomous Systems (Decisional Forensics)’ in Andrew P. Williams and Paul D. Scharre (eds.), Autonomous Systems: Issues for Defence Policymakers (Headquarters Supreme Allied Commander Transformation 2015)

Kim H-K., ‘Sentry Robots in Action: Ethical and Legal Issues of Automated Weapon in South Korea’ [2022] CLAWAR Association Ltd. https://www.clawar.org/icres2022/wp-content/uploads/2022/07/ICRES2022_paper_8.pdf

Kosmo Berntsen A., Kischel C., and Husmann N., ‘Autonomous Weapons and Soldier Morale’ (The Defence Horizon Journal, 15 October 2025) https://tdhj.org/blog/post/autonomous-weapons-morale/

Kwik J., ‘The Conceptual Roots of the Criminal Responsibility Gap in Autonomous Weapon Systems’ (2023) 24(1) Melbourne Journal of International Law

Lee J., ‘Autonomous Weapons, War Crimes, and Accountability’ (2025) 49 N.C. J. INT'L L. https://scholarship.law.unc.edu/ncilj/vol49/iss2/4

Longobardo M., ‘State Immunity and Judicial Countermeasures’ (2021) 32(2) European Journal of International Law

Marchant G.E, Allenby B., Arkin R., Barrett E.T., Jason Borenstein, Lyn M Gaudet, Orde Kittrie, Patrick Lin, George R Lucas, Richard O’Meara and Jared Silberman, ‘International Governance of Autonomous Military Robots’ (2011) Columbia Science and Technology Law Review XII 272

Mandl S. and Planitzer J., ‘Who is a Victim? The Concept of Victim in the Victims’ Rights Directive: A Human Rights Analysis of the Concept of Victim from a Gender-Specific Perspective’ (2022) 12 SIAK-Journal – Journal for Police Science and Practice (International Edition) 49

Mashadi M.I., ‘The Impact of Autonomous Weapon Systems on Civilian Protection: A Legal Analysis under International Humanitarian Law’ (2025) https://www.researchgate.net/publication/393149777_The_Impact_of_Autonomous_Weapon_Systems_on_Civilian_Protection_A_Legal_Analysis_under_International_Humanitarian_Law

McDougall C., ‘Autonomous Weapon Systems and Accountability: Putting the Cart Before the Horse’ (2019) 20 *Melbourne Journal of International Law*

Milanović M., ‘Norm Conflicts, International Humanitarian Law, and Human Rights Law’ in Orna Ben-Naftali (ed.), International Humanitarian Law and International Human Rights Law (Oxford University Press 2011)

Miller S., ‘Lethal Autonomous Weapon Systems (LAWS): Meaningful Human Control, Collective Moral Responsibility and Institutional Design’ (2025) Ethics and Information Technology

Moyes R., ‘Meaningful Human Control’ in Robin Geiß (ed.), *Lethal Autonomous Weapons Systems: Technology, Definition, Ethics, Law and Security* (German Federal Foreign Office 2016)
https://www.auswaertiges-amt.de/resource/blob/204830/5f26c2e0826db0d000072441fdeaa8ba/abruestung-laws-data.pdf

Noone G. and Noone D., ‘The Debate over Autonomous Weapons Systems’ (2015) 47 Case Western Reserve Journal of International Law
https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=1005&context=jil

O’Connell M.E., ‘Banning Autonomous Weapons: A Legal and Ethical Mandate’ (2023) 37(3) Ethics & International Affairs

Orakhelashvili A., ‘The Interaction between Human Rights and Humanitarian Law: Fragmentation, Conflict, Parallelism, or Convergence?’ (2008) 19(1) European Journal of International Law

Park I., The Right to Life in Armed Conflict (Oxford University Press 2018)
https://doi.org/10.1093/oso/9780198821380.001.0001

Perišić P., ‘Killed by Robot or Human: Considerations on Autonomous Weapons Systems and Human Dignity’ (2025) 73(3) *Anali Pravnog fakulteta u Beogradu*
https://www.researchgate.net/publication/395947216_Killed_by_Robot_or_Human_Considerations_on_Autonomous_Weapons_Systems_and_Human_Dignity

Salmón E. and Pérez-León-Acevedo J.B., ‘Reparation for Victims of Serious Violations of International Humanitarian Law: New Developments’ (2022) 104 International Review of the Red Cross

Santoni de Sio F. and van den Hoven J., ‘Meaningful Human Control over Autonomous Systems: A Philosophical Account’ (2018) *Frontiers in Robotics and AI* https://doi.org/10.3389/frobt.2018.00015

Santra G., 'International Humanitarian Law: A Balance between Military Necessity and Humanity' (2021) 4 Int'l JL Mgmt & Human 2914

Sari A., ‘Indiscriminate Attacks and the Proportionality Rule: What is Incidental Civilian Harm?’ (12 June 2025) SSRN https://ssrn.com/abstract=5294476

Sassòli M-, ‘The Role of Human Rights and International Humanitarian Law in New Types of Armed Conflicts’ in Orna Ben-Naftali (ed.), International Humanitarian Law and International Human Rights Law (Oxford University Press 2011)

Sayler K., 'Defense Primer: U.S. Policy on Lethal Autonomous Weapon Systems' (2023), Congressional Research Service

Schmitt M.N., ‘Military Necessity and Humanity in International Humanitarian Law: Preserving the Delicate Balance’ (2010) 50(4) Virginia Journal of International Law

Sehrawat V., ‘Autonomous Weapon Systems and Meaningful Human Control’ (2025) 33 *International Journal of Law and Information Technology* https://doi.org/10.1093/ijlit/eaaf007

Shapir Y.S., ‘Lessons from the Iron Dome’ (2013) 5 Military and Strategic Affairs https://www.inss.org.il/wp-content/uploads/sites/2/systemfiles/MASA5-1Eng4_Shapir.pdf

Sparrow R., ‘Robots and Respect: Assessing the Case Against Autonomous Weapon Systems’ (2016) 30(1) Ethics & International Affairs

Thanvi V.J., ‘State Responsibility under International Law’ (2023) 6(1) International Journal of Law Management & Humanities

Verdiesen I., Santoni de Sio F. and Dignum V., ‘Accountability and Control Over Autonomous Weapon Systems: A Framework for Comprehensive Human Oversight’ (2021) 31(1) Minds and Machines https://doi.org/10.1007/s11023-020-09532-9

Weigend T., ‘Convicting Autonomous Weapons?’ (2023) 21 Journal of International Criminal Justice

Wilde R., ‘The Extraterritorial Application of International Human Rights Law on Civil and Political Rights’ in Scott Sheeran and Nigel S Rodley (eds), Routledge Handbook of International Human Rights Law (Routledge 2013)

Williams A. and Scharre P., ‘Autonomous Systems Issues for Defence Policymakers Headquarters Supreme Allied Commander Transformation’ (2015)

Williams A., ‘Defining Autonomy in Systems: Challenges and Solutions’ in Andrew P. Williams and Paul D. Scharre (eds.), Autonomous Systems: Issues for Defence Policymakers (Headquarters Supreme Allied Commander Transformation 2015)

Winter E., ‘The Compatibility of Autonomous Weapons with the Principles of International Humanitarian Law’ (2022) 27(1) Journal of Conflict and Security Law 1 https://academic.oup.com/jcsl/article/27/1/1/6513626

LEGAL INSTRUMENTS

Assembly of States Parties, *Rules of Procedure and Evidence of the International Criminal Court* (adopted 9 September 2002) ICC-ASP/1/3

Declaration Renouncing the Use, in Time of War, of Explosive Projectiles Under 400 Grammes Weight (adopted 11 December 1868, entered into force 11 December 1868) 138 Consol TS 297

Geneva Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (adopted 12 August 1949, entered into force 21 October 1950) 75 UNTS 31

Geneva Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea (adopted 12 August 1949, entered into force 21 October 1950) 75 UNTS 85

Geneva Convention (III) relative to the Treatment of Prisoners of War (adopted 12 August 1949, entered into force 21 October 1950) 75 UNTS 135

Geneva Convention (IV) relative to the Protection of Civilian Persons in Time of War (adopted 12 August 1949, entered into force 21 October 1950) 75 UNTS 287

International Covenant on Civil and Political Rights (adopted 16 December 1966, entered into force 23 March 1976), 999 UNTS 171

International Law Commission, Articles on the Responsibility of States for Internationally Wrongful Acts (2001), UN Doc A/56/10

Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Additional Protocol I) (adopted 8 June 1977, entered into force 7 December 1978) 1125 UNTS 3

Rome Statute of the International Criminal Court (adopted 17 July 1998, entered into force 1 July 2002) 2187 UNTS 3
UN GA First Committee, 'Lethal Autonomous Weapons Systems' (Draft Resolution A/C.1/79/L.77, 2024) https://documents.un.org/doc/undoc/ltd/n24/305/45/pdf/n2430545.pdf

UN General Assembly, Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law (UNGA Res 60/147, 16 December 2005)

UN General Assembly, Declaration of Basic Principles of Justice for Victims of Crime and Abuse of Power (UNGA Res 40/34, 29 November 1985)

UN General Assembly, The Right to Privacy in the Digital Age (UNGA Res 75/176, 16 December 2020)

Universal Declaration of Human Rights (adopted 10 December 1948 UNGA Res 217 A(III))

US Department of Defense, DoD Directive 3000.09: Autonomy in Weapon Systems (2023) https://www.esd.whs.mil/portals/54/documents/dd/issuances/dodd/300009p.pdf

CASE LAW

Armed Activities on the Territory of the Congo (Democratic Republic of the Congo v. Uganda) (Judgment) [2005] ICJ Rep. 168

Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory (Advisory Opinion) [2004] ICJ Rep 136, 178

Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion) [1996] ICJ Rep 226

Loizidou v. Turkey, App. no. 15318/89 (ECtHR, 18 December 1996) 100 Al-Skeini and others v. United Kingdom, App. no. 55721/07 (ECtHR, 7 July 2011)

REPORTS AND OTHER DOCUMENTS FROM INTERNATIONAL ORGANIZATIONS

Bo M., Bruun L., and Boulanin V., 'Retaining Human Responsibility in the Development and Use of Autonomous Weapon Systems: On Accountability for Violations of International Humanitarian Law Involving AWS' (Stockholm International Peace Research Institute (SIPRI),

October 2022)
https://www.sipri.org/publications/2022/policy-reports/retaining-human-responsibility-development-and-use-autonomous-weapon-systems-accountability

Boulanin V., 'Implementing Article 36 Weapon Reviews in the Light of Increasing Autonomy in Weapon Systems' (SIPRI Insights on Peace and Security No 2015/1, Stockholm International Peace Research Institute, November 2015)
https://www.sipri.org/sites/default/files/files/insight/SIPRIInsight1501.pdf

Davison N., 'Autonomous Weapon Systems under International Humanitarian Law' in *UNODA Occasional Papers No. 30* (United Nations Office for Disarmament Affairs, November 2017)
https://doi.org/10.18356/29a571ba-en

Federal Republic of Germany, *Lethal Autonomous Weapon Systems (LAWS): Statement by Germany to the CCW Informal Meeting of Experts* (United Nations Office for Disarmament Affairs, Geneva, 2014)
https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-_Informal_Meeting_of_Experts_(2014)/Germany%2BLAWS%2B2014.pdf

Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, 'Report of the 2019 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems' (Convention on Certain Conventional Weapons, UN Doc CCW/GGE.1/2019/3, 2019)

Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, *Draft Report of the 2023 Session* UN Doc CCW/GGE.1/2023/CRP.2 (12 May 2023)
https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2023)/CCW_GGE1_2023_CRP.2_12_May.pdf

Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, *Working Paper Submitted by Bulgaria, Denmark, France, Germany, Italy, Luxembourg and Norway,* UN Doc CCW/GGE.1/2024/WP.3 (1 March 2024)
https://docs-library.unoda.org/Convention_on_Certain_Conventional_Weapons_-Group_of_Governmental_Experts_on_Lethal_Autonomous_Weapons_Systems_(2024)/CCW-GGE.1-2024-WP.3.pdf

Heyns C., 'Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, A/HRC/23/47' (2013) UN Human Rights Council

International Committee of the Red Cross, What is International Humanitarian Law?. (ICRC Factsheet, July 2004)
https://www.icrc.org/sites/default/files/document/file_list/what-is-ihl-factsheet.pdf

International Committee of the Red Cross (ICRC), Autonomous Weapon Systems: Technical, Military, Legal and Humanitarian Aspects (Expert Meeting, Geneva, 26–28 March 2014, published November 2014)
International Committee of the Red Cross, Views of the ICRC on Autonomous Weapon Systems (Convention on Certain Conventional Weapons, Meeting of Experts on Lethal Autonomous Weapons Systems, 11–15 April 2016, Geneva) (2016)
https://www.icrc.org/sites/default/files/document/file_list/ccw-autonomous-weapons-icrc-april-2016.pdf

International Committee of the Red Cross, *Autonomous Weapon Systems: Implications of Increasing Autonomy in the Critical Functions of Weapons* (ICRC 2017)
https://icrcndresourcecentre.org/wp-content/uploads/2017/11/4283_002_Autonomus-Weapon-Systems_WEB.pdf

International Committee of the Red Cross, 'What You Need to Know about Autonomous Weapons' (ICRC, 26 July 2022)
https://www.icrc.org/en/document/what-you-need-know-about-autonomous-weapons

International Committee of the Red Cross, The Principles of Humanity and Necessity (ICRC, March 2023)
https://www.icrc.org/sites/default/files/wysiwyg/war-and-law/02_humanity_and_necessity-0.pdf

International Committee of the Red Cross, Autonomous Weapon Systems and International Humanitarian Law: Selected Issues (ICRC, March 2026)
https://www.icrc.org/sites/default/files/202603/4896_002_Autonomous_Weapons_Systems_-_IHL-ICRC.pdf

International Law Commission, 'Conclusions of the Work of the Study Group on the Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law' (2006) UN Doc A/CN.4/L.702

Kiai M. and Heyns C., *Joint Report of the Special Rapporteur on the Rights to Freedom of Peaceful Assembly and of Association and the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions on the Proper Management of Assemblies,* UN Doc. A/HRC/31/66 (4 February 2016) https://digitallibrary.un.org/record/831673

Office of the United Nations High Commissioner for Human Rights, 'What are Human Rights?' (OHCHR) https://www.ohchr.org/en/what-are-human-rights

UN Human Rights Committee, General Comment No 16: Article 17 (Right to Privacy) (8 April 1988)

UN Human Rights Committee, General Comment No 36 (2018) on Article 6 of the International Covenant on Civil and Political Rights, on the Right to Life (30 October 2018) UN Doc CCPR/C/GC/36

UN Secretary-General, *Lethal Autonomous Weapon Systems* UN Doc A/79/88 (1 July 2024) https://docs-library.unoda.org/General_Assembly_First_Committee_-Seventy-Ninth_session_(2024)/A-79-88-LAWS.pdf

United Nations and International Committee of the Red Cross, 'Joint Call by the United Nations Secretary-General and the President of the International Committee of the Red Cross for States to Establish New Prohibitions and Restrictions on Autonomous Weapon Systems' (ICRC, 5 October 2023) https://www.icrc.org/en/document/joint-call-un-and-icrc-establish-prohibitions-and-restrictions-autonomous-weapons-systems

United Nations, *Report of the 2014 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS)* UN Doc G14/048/96 (2014) https://documents.un.org/doc/undoc/gen/g14/048/96/pdf/g1404896.pdf

United Nations Office for Disarmament Affairs, 'Lethal Autonomous Weapon Systems' (Unoda.org 2025) https://disarmament.unoda.org/en/our-work/emerging-challenges/lethal-autonomous-weapon-systems

US Department of Defense, Unmanned Systems Roadmap: 2007–2032, (2007) Government Publishing Office https://www.govinfo.gov/content/pkg/GOVPUB-D-PURL-LPS91893/pdf/GOVPUB-D-PURL-LPS91893.pdf

REPORTS AND OTHER DOCUMENTS FROM NGOs

Article 36, *Killer Robots: UK Government Policy on Fully Autonomous Weapons* (April 2013) https://article36.org/wp-content/uploads/2013/04/Policy_Paper1.pdf

Horowitz M.C. and Scharre P., *Meaningful Human Control in Weapon Systems: A Primer* (Center for a New American Security 2015),

https://s3.us-east-1.amazonaws.com/files.cnas.org/documents/Ethical-Autonomy-Working-Paper_031315.pdf

Human Rights Watch and Harvard Law School International Human Rights Clinic, *Mind the Gap: The Lack of Accountability for Killer Robots* (Human Rights Watch, 9 April 2015) https://www.hrw.org/report/2015/04/09/mind-gap/lack-accountability-killer-robots

Human Rights Watch and Harvard Law School International Human Rights Clinic, '*A Hazard to Human Rights: Autonomous Weapons Systems and Digital Decision-Making*' (Human Rights Watch 28 April 2025) https://www.hrw.org/report/2025/04/28/a-hazard-to-human-rights/autonomous-weapons-systems-and-digital-decision-making

ICRAC (International Committee for Robot Arms Control), 'Scientists' Call for Ban on Autonomous Lethal Robots' (2013) http://icrac.net/wp-content/uploads/2018/06/Scientist-Call_Press-Release.pdf

Médecins Sans Frontières, Military Necessity (The Practical Guide to Humanitarian Law) https://guide-humanitarian-law.org/content/article/3/military-necessity/

Sharkey N., *Guidelines for the Human Control of Weapons Systems* (ICRAC Working Paper No. 3, CCW GGE April 2018, International Committee for Robot Arms Control 2018) https://www.icrac.net/icrac-working-paper-3-ccw-gge-april-2018-guidelines-for-the-human-control-of-weapons-systems/

Stop Killer Robots, 'Problems with Autonomous Weapons' (Stop Killer Robots 2021) https://www.stopkillerrobots.org/stop-killer-robots/facts-about-autonomous-weapons/

Wareham M., 'The Future of Artificial Intelligence', Human Rights Watch (2022) https://www.hrw.org/news/2022/11/28/future-artificial-intelligence

OTHER MATERIALS AND RESOURCES (online)

Digital Watch Observatory, 'GGE on lethal autonomous weapons systems' (Geneva Internet Platform) https://dig.watch/processes/gge-law

International Committee of the Red Cross (ICRC), *Customary IHL Database* https://ihl-databases.icrc.org/en/customary-ihl/v1

International Committee of the Red Cross (ICRC), 'Military Necessity | How Does Law Protect in War? - Online Casebook' (casebook.icrc.org) https://casebook.icrc.org/a_to_z/glossary/military-necessity

International Criminal Court, ‘Victims’ (ICC Official Website)
https://www.icc-cpi.int/about/victims

Kuwali D., ‘Accountability for Autonomous Lethality - the Raoul Wallenberg Institute of Human Rights and Humanitarian Law’ (*The Raoul Wallenberg Institute of Human Rights and Humanitarian Law,* 27 January 2026)
https://rwi.lu.se/blog/accountability-for-autonomous-lethality/

Roff H.M., ‘Magnifying Human Confusion: Meaningful Human Control and the Ongoing Debate on Autonomous Weapons’ (The Rule of Law Post, Centre for Ethics and the Rule of Law, 6 May 2024)
https://www.penncerl.org/the-rule-of-law-post/magnifying-human-confusion-meaningful-human-control-and-the-ongoing-debate-on-autonomous-weapons/

Schwarz E., ‘The (Im)Possibility of Meaningful Human Control for Lethal Autonomous Weapon Systems’ (Humanitarian Law & Policy Blog, 29 August 2018)
https://blogs.icrc.org/law-and-policy/2018/08/29/im-possibility-meaningful-human-control-lethal-autonomous-weapon-systems/

Trabucco L., ‘What Is “Meaningful Human Control,” Anyway? Cracking the Code on Autonomous Weapons and Human Judgment’ (Modern War Institute, 21 September 2023)
https://mwi.westpoint.edu/what-is-meaningful-human-control-anyway-cracking-the-code-on-autonomous-weapons-and-human-judgment/

United Nations, ‘Victims’ Rights First’ https://www.un.org/en/victims-rights-first

Zamani M., ‘How Meaningful Is “Meaningful Human Control” Anyway? Cracking the Code on Autonomous Weapons and Human Judgment’ (Articles of War, Lieber Institute for Law & Warfare, 26 March 2025)
https://lieber.westpoint.edu/how-meaningful-is-meaningful-human-control-laws-regulation/

GAI TOOLS

GAI tools were used as supplementary tools, they did not replace the author’s critical thinking on the subject or the creation of the content. AI was only used for grammar checking and language refinement (improving sentence clarity and finding synonyms to avoid repetitions).