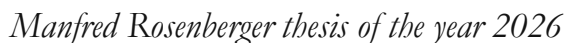


Romane Malbec



International humanitarian law challenged by the use of military AI:

A study of an artificial intelligence system designed for human targeting

Romane Malbec

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International humanitarian law challenged by the use of military AI:

**A study of an artificial intelligence system
designed for human targeting**

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List of abbreviations

AI-Act	European regulation on artificial intelligence (2024)
AI	Artificial intelligence
AIS	Artificial Intelligence System
AWS	Autonomous weapon systems
CCW	Convention on Certain Conventional Weapons
CNIL	French Data Protection Authority
DARPA	Defence Advanced Research Projects Agency
DL	Deep Learning
DoD	US Department of Defense
EU	European Union
FCAS	Future Combat Air System
GEG	Government Expert Group
<i>Ibid.</i>	<i>Ibidem</i> (same author and same work)
ICRC	International Committee of the Red Cross
IHL	International Humanitarian Law
JAIC	Joint Artificial Intelligence Centre
LAWS	Lethal autonomous weapon system
MGCS	Main Ground Combat System
ML	Machine Learning
NATO	North Atlantic Treaty Organisation
NCIA	NATO Communications and Information Agency
Op. cit.	Opus citatum (cited work)
p	page
PLA	People's Liberation Army
pp.	page number
UAV	Unmanned Aerial Vehicle
UN	United Nations

Introduction

“Artificial intelligence (AI) technology has reached such a level that the deployment of these systems is — practically, if not legally — conceivable within a few years, rather than decades, with major implications: autonomous weapons have been described as the third revolution in the art of warfare, after gunpowder and nuclear weapons.”¹

1. This phrase, taken from an open letter published on 28 July 2015 on the occasion of *the International Joint Conference on Artificial Intelligence*, powerfully sums up the technological and ethical rupture facing modern societies. It is a fact that the emergence of artificial intelligence in the field of warfare is profoundly transforming the paradigms of combat, command and law, some people even wondering whether this is not “*a new military revolution?*”² Autonomous or semi-autonomous systems are now capable of analysing data, identifying targets and, in some cases, making lethal decisions without direct human intervention. The prospect of large-scale deployment of lethal autonomous weapon systems (LAWSs) or AI-based targeting systems is no longer a mere futuristic hypothesis. Although these systems have not yet

¹ Future of Life Institute, “Autonomous Weapons Open Letter: AI & Robotics Researchers”, 9 February 2016. Available at [\[Link\]](#).

² Jean-Christophe Noël, “Artificial Intelligence: Towards a New Military Revolution?”, October 2018. Available in PDF format at [\[Link\]](#).

achieved full autonomy, the use of AI in armed conflict is already a reality, as evidenced by its use in Ukraine and Israel.³

2. International humanitarian law (IHL), sometimes referred to as the law of war or the law of armed conflict,⁴ encompasses all the rules of international law designed to protect, in time of armed conflict, persons affected by hostilities and property not directly involved in the fighting.⁵ It is based on fundamental principles such as distinction, proportionality, precaution, military necessity and responsibility, the implementation of which generally requires human assessment in context.⁶

3. The technology we are interested in, Artificial Intelligence, has been at the heart of discussions and debates in recent years, making it both a technological and political tool, as evidenced by the recent AI summit held in Paris on 10 and 11 February.

4. However, there is no universal consensus on the definition of Artificial Intelligence. In fact, there are several definitions of what AI is.

³ Amélie Férey and Laure de Roucy-Rochegonde, “From Ukraine to Gaza: Artificial Intelligence at War,” article published in the journal *Politique Étrangère*, vol. 89, no. 3, Autumn 2024. Available in PDF format at [\[Link\]](#).

⁴ *Manual of Military Operations Law*, 2022 edition. Available in PDF format.

⁵ *Ibid.*

⁶ Defence Ethics Committee, principle no. 8 of the opinion on the use of artificial intelligence technologies by the armed forces, 14 January 2025. Available in PDF format.

5. The historical definition of AI was given in a proposal for the “Dartmouth summer research on artificial intelligence” project in 1956 by four pioneering researchers in the field. They defined AI as follows: *“To proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it”*.⁷ This conference was a defining moment in the history of artificial intelligence, widely recognised as the event that gave rise to the discipline.

6. Subsequently, several authors and researchers have attempted to define it. According to Yann Lecun, a French researcher in AI and artificial vision on Facebook, AI can be defined as *“the ability of machines to make decisions and adopt behaviours generally attributed to humans or animals, but with a lower level of performance.”*⁸

7. Others have preferred to define AI as a discipline in its own right. This is the case in France, which defines it as *“an interdisciplinary theoretical and practical field whose purpose is to understand the mechanisms of cognition and reflection, and to imitate them using hardware and software, for the purpose of assisting or replacing human activities.”*⁹

⁷ Dartmouth College, “A proposal for the Dartmouth summer research project on artificial intelligence”, 31 August 1955.

⁸ Definition of AI by Yann Lecun. Article from the journal *DéfiS*, No. 8, 12 November 2019, written and published under the direction of the French National Institute for Higher Studies in Security and Justice (INHESJ), which has merged with the French Institute for Higher Studies of the French Ministry of the Interior (IHEMI).

⁹ *Official Journal of the French Republic*, No. 0285 of 9 December 2018, Commission for the Enrichment of the French Language, “Vocabulary of artificial intelligence (list of terms, phrases and definitions adopted)”.

8. More recently, AI as a discipline has disappeared, giving way to a definition of an Artificial Intelligence System (AIS). According to the European Regulation on Artificial Intelligence of 13 June 2024, an AIS is defined as follows: “a machine-based system that is designed to operate with varying levels of autonomy and can demonstrate adaptability after deployment, and which, for explicit or implicit purposes, infers from the data it receives how to generate outputs such as predictions, content, recommendations or decisions that may influence physical or virtual environments.”¹⁰

9. The defence sector is one of the main fields of application for artificial intelligence. It is also identified as one of the four priority areas by the Villani report, alongside health, transport and the environment, as part of the strategy to “*Give meaning to artificial intelligence.*”¹¹

10. This debate therefore lies at the intersection of several historical, technological and legal dynamics. It is part of a long history of transformation of weapons and their regulation by international law, from the Hague and Geneva Conventions to contemporary discussions on new weapons within the framework of the Convention on Certain Conventional Weapons (CCW). This dynamic is marked by a constant movement of legal responsiveness to technological innovations in which “*there is*

¹⁰ European Commission, Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules concerning artificial intelligence.

¹¹ Report by Cédric Villani, “Giving meaning to artificial intelligence (AI)”, 28 March 2018.

sometimes a significant delay between the technological breakthroughs observed and the standards likely to regulate them.”¹²

11. Thus, lawyers have gradually turned their attention to the study of chemical weapons, biological weapons, anti-personnel mines and blinding laser weapons. The issue of military AI systems is part of this trend, while at the same time changing the game due to the scale of the legal, ethical and technical challenges it raises.

12. The emergence of AI in the military sphere reveals a new relationship between humans, machines and violence through the use of lethal force,¹³ which calls into question the very foundations of a just war, the chain of command and the right to life. Furthermore, these technologies are mastered to varying degrees by different states, which exacerbates geopolitical tensions. The race for military AI now involves powers such as the United States, China, Israel, Russia¹⁴ and NATO members against each other, raising far-reaching strategic questions about the balance of power and global stability.

¹² Kirkham, Joanne, *Lethal Autonomous Weapon Systems: A Study in International Law*, submitted 10 December 2022.

¹³ United Nations Institute for Disarmament Research, “Table-Top Exercises on the Human Element and Autonomous Weapon Systems, Summary Report”, Giacomo Persi Paoli, Alice Spazian, Alisha Anand, This report summarises the findings of UNIDIR's series of regional Table-Top Exercises conducted between September 2020 and June 2021. Available in PDF format at [\[Link\]](#).

¹⁴ French National Institute for Strategic and Political Affairs, “Geopolitical implications and international competition: the new race for military AI”, available at [\[Link\]](#).

13. In order to understand the legal issues related to the use of artificial intelligence in human targeting, it is essential to precisely define the scope of this study. The field of artificial intelligence technologies used for military purposes is extremely broad. It encompasses intelligence support and decision support systems¹⁵ as well as fully autonomous lethal systems. The subject of our study focuses more specifically on artificial intelligence systems used for human targeting, *i.e.* all operations carried out against individuals in order to neutralize them.¹⁶

14. Here, we will focus on two categories of systems which, although they perform a targeting function, differ crucially in terms of human governance.

15. As early as 2013, Christof Heyns, the Special Rapporteur of the United Nations General Assembly, defined lethal autonomous robots (LARs) as “*robotic weapon systems that, once activated, can select and engage targets without further intervention by a human operator. The important element is that the robot has an autonomous ‘choice’ regarding selection of a target and the use of lethal force.*”¹⁷

¹⁵ Defence Ethics Committee, “Opinion on the use of artificial intelligence technologies by the armed forces”, *op. cit.*

¹⁶ Éric Gomez, “Targeting by the military” in: *Les guerres de l’information à l’ère numérique* (Information Wars in the Digital Age), edited by Céline Marangé and Maud Quessard, Hors collection, 2021, Presses Universitaires de France, 456 pages.

¹⁷ Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, 9 April 2013, document A/HRC/23/47, §38, p. 8.

16. The European Parliament’s resolution of 12 September 2018 on autonomous weapon systems defines them as “*weapon systems without effective human control over the critical functions of target selection and attack.*”¹⁸

17. The French Defence Ethics Committee states that the concept of lethal weapon systems must be limited to the integration of autonomy into these weapon systems. For this committee, LAWSs (lethal autonomous weapon systems) are “*lethal weapons systems programmed to be capable of making their operating rules supersede the initially set framework of employment, in order to be able to use this programming to calculate a decision for action without assessment of the situation by the commander.*”¹⁹ This committee continues to frame the definition of this concept, distinguishing it from lethal weapons systems incorporating autonomy, hereinafter referred to as “AI-enabled weapon systems”. These are therefore defined by this committee as “*a lethal weapon system whose decision-making functions (in the sense of robotic decision-making autonomy) are dependent on a specific framework for action. They cannot take lethal initiatives that would lead them to modify their area of operation.*”²⁰

¹⁸ European Parliament, “European Parliament resolution of 12 September 2018 on autonomous weapon systems.”

¹⁹ Defence Ethics Committee, Opinion on the integration of autonomy in lethal weapons systems, 29 April 2021, Ministry of the Armed Forces.

²⁰ *Ibid.*

18. In short, lethal autonomous weapons systems (LAWSs) can be defined as “*systems that, once activated, are capable of identifying a target and using lethal force without being supervised by a human operator.*”²¹

19. This type of system can take the form of self-guided missiles, militarised robots or UAVs,²² and is therefore characterised by complete decision-making autonomy in the use of lethal force, including against human targets. This autonomy is made possible by breakthroughs in artificial intelligence, which now allow machines to be entrusted with “*cognitive functions such as recognition, classification, learning and decision-making*”.²³ It is based on advanced data processing and contextual analysis algorithms, as well as the integration of technologies such as facial recognition via sensors,²⁴ or deep neural networks.

However, the very concept of LAWS remains legally vague. Despite attempts to regulate it, “*LAWSs, sometimes readily equated with ‘killer robots’, are not yet subject to a common definition.*”²⁵ Since 2013, the Group of Governmental Experts on LAWSs, convened under the Convention on Certain Conventional Weapons, has been

²¹ De Roucy-Rochegonde, Laure, *War in the Age of Artificial Intelligence: When Machines Take Up Arms*, Presses Universitaires de France, 1st edition, October 2024, p. 12.

²² Pérémarty Léa, “Autonomous lethal weapons: between myths and confusion,” 26 July 2023. Available at [\[Link\]](#).

²³ French National Assembly, Information Report No. 3248 concluding the work of a fact-finding mission on lethal autonomous weapons systems, 22 July 2020.

²⁴ Future of Life Institute, “A Diplomat’s Guide to Autonomous Weapons Systems”, 2024. Available in PDF format at [\[Link\]](#).

²⁵ Biblioveille “Lethal Autonomous weapon systems (LAWSs)”, March 2021. Available in PDF format at [\[Link\]](#).

tasked with “*providing a common definition and an international legal framework to supervise its development.*”²⁶ Indeed, this lack of a unified definition undermines any attempt at regulation and makes it more difficult to analyse their compatibility with IHL.

20. Conversely, some current systems, such as the Israeli *Lavender* system, incorporate AI to assist human operators in targeting operations, without replacing the final decision-making process, *i.e.* the lethal decision. These systems operate in a “human-in-the-loop” mode, in which “*the system performs the assigned task autonomously, but requires human intervention to validate and implement certain specific actions.*”²⁷ AI is used for “*advanced analytical capabilities, massive data processing and real-time connectivity, transforming the dynamics of decision-making on the battlefield,*”²⁸ and above all “*to generate thousands of potential 'targets' for military strikes in the heat of war,*”²⁹ but the final strike can only be triggered after validation by a human operator. This type of system, although incorporating advanced automation mechanisms, does not therefore fall within the strict definition of LAWSs but it also raises questions, particularly regarding the actual degree of human supervision and the excessive trust that operators may place in AI suggestions, thus coming very close to LAWSs. However, “*The fact that machines autonomously target human beings is a*

²⁶ Barrier, Félicité, “Lethal Autonomous Weapon Systems (LAWS): towards a new arms race?” pp. 19-24 in: *Revue Défense Nationale*, 2018/5, no. 810. Available at [Link].

²⁷ UNIDIR, *op. cit.*

²⁸ ISMAILOVIC, Muzen, “Algorithmic targeting: the role of artificial intelligence in Israeli strikes on Gaza and its ethical implications,” 20 February 2025. Available in PDF format at [Link].

²⁹ ABRAHAM, Yuval, “Lavender: The AI machine directing Israel’s bombing spree in Gaza”, *+972 Magazine*, 3 April 2024. Available at [Link].

moral line that should not be crossed.”³⁰ This is the focus of the legal debate in our study.

21. These different uses of AIs in military operations also lead us to distinguish between different levels of automation in military AI systems. On this point, Thierry Berthier has produced a very illuminating classification.³¹

Thus, a human targeting system incorporating AI under human supervision, such as Lavender, would fall into category L3 “*Autonomous weapon system subject to firing authorization*” but without the “*weapon component of the system*”, since this type of system does not go so far as to use lethal force; it is the human operator who does so.

Conversely, a LAWS would fall under category L5, that of “*autonomous weapon systems without human supervision*,”³² in which the human operator cannot regain control. The system determines its own movements based on its perception of the terrain and its mission, detects and identifies objects autonomously, selects its targets using its sensors and analytical capabilities, and can open fire without human intervention or the possibility of deactivation, except by destruction.

22. Furthermore, the growing role of private companies, such as the partnership between the French company Mistral AI and the

³⁰ United Nations, “Joint appeal by the UN Secretary-General and the President of the ICRC calling on States to formulate new prohibitions and limitations for autonomous weapons systems,” 5 October 2023. Available at [Link].

³¹ Berthier, Thierry, “Semi-autonomous weapon systems: what can autonomy bring?”, *Revue Défense Nationale*, 2019/5, no. 820, pp. 74-80. Available at [Link].

³² *Ibid.*

Ministerial Agency for Defence AI³³ for France, or NATO's acquisition of the *Maven Smart System* NATO, developed by Palantir,³⁴ illustrates the importance of the issue for political and military decision-makers and raises questions about the regulation of these new forms of technological power.

Massive investments in military AI are also a pressure factor. AI, as a technology, is seen by many nations as a key to maintaining their strategic superiority, as evidenced by Vladimir Putin's statement, "*Whoever becomes the leader in this field will be the master of the world.*"³⁵ Global security issues are at stake, and it is imperative to determine whether the current IHL framework is robust enough to adequately regulate the use of these new weapons.

23. Point at issue. By introducing increasing automation into analysis, identification and potential neutralisation of human targets, these systems are disrupting the foundations of military law and ethics. This technological development challenges existing legal frameworks, in particular international humanitarian law, whose principles have historically been based on human assessment of context and consequences. The United Nations General Assembly has declared that "*international law, in particular*

³³ French Ministry of Armed Forces, Agreement between AMIAD and Mistral IA, "Defence AI: Sébastien Lecornu inaugurates the AMIAD research centre". Available at [[Link](#)].

³⁴ Sauveton, Pierre, "Military AI: NATO chooses Palantir, France responds with Artemis, Gen AI... and Comand AI," 23 April 2025. Available at [[Link](#)].

³⁵ Tanguy, Vincent, "Putin believes he can dominate the world by mastering artificial intelligence", article published in the journal *Sciences et Avenir*, 05/09/2017.

*the Charter of the United Nations, international humanitarian law, international human rights law and international criminal law, applies to autonomous weapons systems.”*³⁶ However, the divide that AI creates from a legal, ethical and technical perspective raises a crucial question. Does international humanitarian law really provide a framework for the use of artificial intelligence systems designed to target humans in operational contexts?

24. Methodology. The importance of this subject lies in its immediate relevance in the current geopolitical and military context. The increasing power of AI technologies, coupled with a frantic race to militarise Artificial Intelligence, calls for urgent reflection on the legal frameworks governing the use of such technologies. The aim here is to examine how far international humanitarian law is relevant or can be adapted to AI-based human targeting systems in operational situations. The following analysis will therefore focus primarily on LAWSs and human targeting systems that integrate AI under human supervision. It will examine both their adaptation to IHL and the difficulties that these systems may pose from a legal and technical perspective.

By focusing our attention on these two configurations, we have made a deliberate choice not to study all military uses of AI, in order to concentrate on the most critical and controversial implications. This methodological choice is in line with the logic of IHL, which lays central emphasis on the human factor both in

³⁶United Nations General Assembly, “Resolution adopted by the General Assembly on 22 December 2023,” A/RES/78/241. Available in PDF format at [[Link](#)].

the principle of responsibility and in the principles of distinction, precaution and proportionality, which require human implementation.

25. Study outline. The increasing introduction of artificial intelligence into military systems, particularly in targeting functions, requires rigorous examination of their compatibility with the fundamental principles of international humanitarian law (PART 1). However, given the current legal limitations, this technological development also calls for the need to adapt IHL in order to ensure the protection of individuals in a context marked by the increasing automation of armed violence (PART 2).

Part 1. Military AI systems and their compliance with IHL

26. Due to their increasing autonomy, artificial intelligence systems for military use raise important questions about their compliance with international humanitarian law. This section will first examine legal bases for the use of force under IHL (Chapter 1), before analysing the specific challenges posed by the integration of human targeting AI systems into this normative framework (Chapter 2).

Chapter 1: Legal aspects

27. In order to better understand the issues related to the integration of military AI systems into international humanitarian law, it is first necessary to review the origins of this body of law (Section 1), before analysing the fundamental principles applicable to armed forces using AI (Section 2).

Section 1: The origins of IHL in *Jus in Bello*

28. Rooted in ancient practices of limiting violence in times of war, IHL was initially established as an essentially customary law, shaped by military customs and traditions (§1). It was only gradually, particularly from the 19th century onwards, that modern humanitarian law emerged (§2).

§ 1 History of IHL: a law based essentially on custom

A) Jus in bello: the legacy of ancient civilisations

29. Historical roots. Long before the emergence of international humanitarian law as codified in the Geneva Conventions and Additional Protocols in the 20th century, human societies sought, empirically, to impose limits on the violence of war. *Jus in bello*, or the law of war applicable during conflict, has its roots in very ancient customary practices. As early as antiquity, civilisations such as Egypt, Greece and Rome adopted formal rules to regulate the treatment of prisoners, spare the wounded and protect certain sacred places.

B) *From ancient wisdom to the ethics of war*

30. Founding principles. For example, in the Mahabharata, the epic that laid the foundations for Indian legal thought, it was already stated that the horrors of war should be limited³⁷ and that non-combatants should not be attacked. The text says: “*Did Indra himself teach you this use of weapons? [...]. Do not the wise strike someone who is distracted or frightened, deprived of a chariot, or someone who asks for mercy, or someone who is in misfortune?*”³⁸. Similarly, in ancient Islam, the teachings of jurists such as Al-Shaybani gave rise to the characterisation of the ideal behaviour of a warrior.³⁹ In Europe, following a decision by the Second Council of the Lateran in 1139, “*the use in wars between Christians of bows and crossbows, considered too deadly weapons*” was prohibited.⁴⁰ All these texts, often drawn from literature, set out principles that foreshadow the modern rules of IHL and show that, even before the current debate on LAWSs, “*the need to protect human beings has consistently guided attempts to regulate the use of force in conflicts*.”⁴¹

³⁷ François Bugnion, “Customary international humanitarian law”, 24 November 2007, PDF version available at: [\[Link\]](#), accessed on 25/04/2024

³⁸ The Mahabharata, “Death of Bhûrisravas,” quoted by Gérard Chaliand, “Anthologie mondiale de la stratégie, des origines au nucléaire” (World Anthology of Strategy, from its Origins to Nuclear Weapons), p. 455.

³⁹ Anne de Luca, “The Caliph, the Soldier and the Peasant: The Art of War in Islam,” *Les Cahiers de l'Orient*, 2017/1 No. 125, Journal article available at: [\[Link\]](#), accessed on 25/04/2025

⁴⁰ Fournier Paul, «Interdiction de l’usage de l’arc et de l’arbalète par le Iie concile de Latran en 1139» (Prohibition of the use of bows and crossbows by the Second Council of the Lateran in 1139), *Comptes rendus des séances de l’Académie des Inscriptions et Belles-Lettres*, 1916, 60-3/ pp. 295-296. Available at: [\[Link\]](#).

⁴¹ French Ministry of Armed Forces, *Manual of Military Operations Law*, 2022 edition, available in PDF format.

C) From custom to the codification of jus in bello

31. Codification. However, these norms often remained fragmented, rooted in specific cultural contexts and strongly imbued with religious references. It was only in the 19th century, with the First Geneva Convention of 22 August 1864 for the improvement of the condition of wounded soldiers in the armies in the field,⁴² that a serious attempt was made to codify *jus in bello* universally. This development reflects an intellectual and moral continuity: even in war, the protection of human dignity cannot be completely suspended. As Frédéric de Martens already stated at the Hague Conference in 1899, conflicts must be governed by “*the laws of humanity and the requirements of public conscience*,”⁴³ a founding idea that still inspires humanitarian law today.

§ 2. *Modern IHL*

A) The birth of contemporary IHL

32. History of modern IHL. Modern international humanitarian law, as it is recognised today, developed gradually from the second half of the 19th century onwards, in a context where the increasing devastation of industrial warfare demanded a comprehensive legal and moral response.

33. Two key figures in this endeavour. International humanitarian law was born under the joint impetus of Henry

⁴² Geneva Convention of 22 August 1864 for the improvement of the condition of wounded soldiers in the armies in the field. Geneva, 22 August 1864.

⁴³ Rupert Ticehurst, “The Martens Clause and the Law of Armed Conflict,” *International Review of the Red Cross*, volume 79, Issue 824, April 1997, pp. 133-142.

Dunant, a humanist businessman, and General Guillaume-Henri Dufour, a respected military officer and strategist. It was after witnessing the bloody battle of Solferino in 1859 that Dunant became aware of the total lack of organised relief for the wounded. On his return to Geneva, he published *A Memory of Solferino* in 1862, a book recounting “*a memory of what this man had tried to do, with a few local inhabitants, to alleviate some of the countless sufferings.*”⁴⁴ Sensitive to this cause, Dufour joined forces with Dunant, and together with Gustave Moynier, Théodore Maunoir and Louis Appia, they formed the “Committee of Five”, which was to give birth to the International Committee of the Red Cross (ICRC) in 1863.⁴⁵

B) The foundations of IHL

34. Adoption of the 1st Geneva Convention. At their instigation, the Swiss government convened a diplomatic conference in 1864 bringing together sixteen states, which adopted the first Geneva Convention. This aimed to improve the fate of soldiers wounded on the battlefield and constitutes the formal birth of modern IHL. This convention was the first to establish binding legal standards for the protection of victims, while recognising the neutrality of medical personnel and war hospitals. While Dunant was the humanitarian inspiration behind it, Guillaume-Henri Dufour's role in the institutional and political structuring of this legal framework was equally crucial.

⁴⁴ Henry Dunant, *A Memory of Solferino*, published in 1862, Preface, p. 5.

⁴⁵ ICRC, “International humanitarian law, answers to your questions”, 0703/001 05.2015 15000. Available in PDF format.

C) Foreign influences on the definition of modern IHL

35. Other international contributions. Alongside this European dynamic, other initiatives enriched the normative foundation of IHL. During the American Civil War (1861-1865), lawyer Francis Lieber developed a code of military conduct in 1863, known as the “Lieber Code.”⁴⁶ This document, considered to be the first codified military code drafted and adopted by the United States, influenced future developments in customary law relating to warfare.⁴⁷ At the turn of the 19th and 20th centuries, States embarked on a process of multilateral codification of the rules of *jus in bello*. The 1906 Geneva Convention extended the initial provisions of 1864⁴⁸ while the 1899 and 1907 Hague Conventions for “*the peaceful settlement of international disputes*”⁴⁹ introduced rules governing the use of weapons, the conduct of hostilities, and the rights of prisoners of war.

However, the two world wars of the 20th century highlighted the glaring limitations of these instruments, particularly with regard to the protection of civilian populations. Following the atrocities committed, and the Nuremberg and Tokyo trials, where international criminal responsibility was established for the first time, a new legal architecture was put in place.

⁴⁶ Lieber Code, 1863, available at: [\[Link\]](#).

⁴⁷ Ministry of the Armed Forces, *Manual of Military Operations Law*, 2022 edition, available in PDF format.

⁴⁸ Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field. Geneva, 6 July 1906. Available at [\[Link\]](#)

⁴⁹ Hague Convention for the Peaceful Settlement of International Conflicts, 1899.

36. The adoption of the Geneva Conventions. The four Geneva Conventions of 12 August 1949, adopted by the international community, decisively broadened the scope of protection of IHL by including civilians, the wounded, shipwrecked persons and prisoners in separate but complementary rules. These texts, regularly supplemented by additional protocols, now form the cornerstone of contemporary international humanitarian law, based on a cardinal principle, that of humane treatment, which “is the true leitmotif of the four Geneva Conventions.”⁵⁰

Section 2: The fundamental principles of IHL

37. International humanitarian law is based on fundamental principles aimed at regulating the use of force and limiting its effects in times of conflict. In particular, it requires a prior examination of the legality of any new weapon or method of warfare (§1), as well as compliance with the principles of distinction, proportionality and precaution in the conduct of hostilities (§2).

⁵⁰ Jean Pictet (ed.), *The Geneva Conventions of 12 August 1949: Commentary, Vol. IV, Geneva Convention relative to the Protection of Civilian Persons in Time of War* (hereinafter GC IV Commentary), ICRC, Geneva, 1958, p. 219. Cited by Cordula Droege Original English, published under the title “In Truth the *leitmotiv*: the prohibition of torture and other forms of ill-treatment in international humanitarian law”, *International Review of the Red Cross*, Vol. 89, No. 867, September 2007, pp. 515-541. Available at [[Link](#)]

§ 1: *Examination of the legality of any new weapon, means or methods*

A) *AI as a weapon, means or method of warfare*

38. International law regulates the methods and means of conducting hostilities. It imposes restrictions on the type of weapons used, the manner in which they are used, and the general behaviour of the parties involved in an armed conflict.⁵¹

39. Definition of a weapon. The legal classification of a weapon is based mainly on two criteria: its nature and its purpose,⁵² *i.e.* the use to which it is put. Therefore, a technology can be considered as military equipment when it is integrated into a system specifically designed or modified for military purposes. This implies an assessment based on both its technical characteristics and its practical application. Similarly, the assessment of a weapon cannot be separated from the operational context and methods of warfare in which it is used.⁵³ This process is part of the legality review, which will be discussed below.⁵⁴

40. In France, the legal definition of a weapon is specified in Article 132-75 of the Penal Code, according to which: “*A weapon is any object designed to kill or inflict injury.*” From a broader technical perspective, a weapon is defined as any object, whether tangible or

⁵¹ ICRC, “Means and Methods of Warfare”

⁵² Serge Rayne, Répertoire de droit pénal et de procédure pénale, Armes-Définition, Chapter 2-Définition (45-68), February 2023.

⁵³ Caroline Brandao, “Analysis of new robotic weapon systems through the lens of Article 36 of Additional Protocol I”, published in the journal Défense Nationale, 2018/HS1 Special Issue, pp. 133-143.

⁵⁴ See *infra*, paragraph 49.

intangible, designed or used for the purpose of harming the physical or psychological integrity of an individual.⁵⁵ This broader approach paves the way for the inclusion of new technologies, such as autonomous systems based on artificial intelligence, into the weapon category

41. As regards artificial intelligence, it should be noted that, taken in isolation, it does not constitute a weapon in the traditional sense, since AI does not directly cause destruction or injury. However, it can be integrated into autonomous weapon systems, such as autonomous combat UAVs automatic targeting systems or lethal autonomous weapon systems, in which it plays a decisive role. Therefore, for the research that concerns us (the use of AI in the military field) it is necessary to distinguish between AI technology, which is not a weapon in itself, and the uses we can make of this technology, particularly for military purposes, which can be seen as methods and means of combat. In this context, AI becomes an essential component, enabling the system to identify targets, make decisions and, potentially, carry out strikes without direct human intervention,⁵⁶ thus turning it into a weapon.

42. Thus, while AI, as such, does not alone meet the definition of a weapon, its integration into devices capable of exerting lethal force makes it become a component that enables the autonomy of certain functions of a weapon system. Combined with lethal

⁵⁵ Cumin, David, *Manuel de droit de la guerre*, Brussels: Bruylant, Collection Paradigme, 2nd ed., 2020, p. 188.

⁵⁶ Without direct human intervention, understood as the system carrying out its mission once activated.

elements, AI contributes directly to the conduct of hostilities and can, as such, be considered a weapon under the principles of IHL.

43. The legal framework. The two substantive rules of weapons law that must be taken into account are the rule against inherently indiscriminate weapons and the rule against weapons that cause unnecessary suffering.

1- The rule against inherently indiscriminate weapons

44. Article 51(5)(b) of Additional Protocol I to the Geneva Conventions provides that “5. *The following types of attacks, among others, shall be considered indiscriminate: (b) attacks which may be expected to cause incidental loss of life or injury to civilians, or damage to civilian property, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.*”

Drawing an analogy between this article and autonomous weapon systems incorporating AI, the latter could be described as “*weapons of indiscriminate destruction*” according to computer scientist N. Sharkey.⁵⁷ In other words, the weapon is indiscriminate in nature if it cannot be directed at a specific target and is as likely to hit civilians as combatants.

However, according to Kenneth Anderson and Matthew C. Waxman, the autonomy of lethal autonomous weapons does not

⁵⁷ Noël Sharkey, “Weapons of Indiscriminate Lethality”, in *Forum des informaticiens pour la paix et la responsabilité sociétale* (FIfF Kommunikation), no. 1/09, pp. 26-29. Quoted by J. Ancelin: “Lethal Autonomous Weapons Systems (LAWS): Legal Issues Arising from the Emergence of a Dehumanised Means of Combat”, 2016. Paragraph 3. Available in PDF format

in itself violate this rule, as long as the system can be fed with reliable targeting information.⁵⁸

2- The rule against weapons that cause unnecessary suffering

45. Article 35(2) of Additional Protocol I to the Geneva Conventions states that “2. *It is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury.*” According to the study by Kenneth Anderson and Matthew C. Waxman, the fact that an autonomous system selects the target or attacks does not violate this rule.⁵⁹

3- Limitation and prohibition of certain weapons of war

46. International humanitarian law strictly regulates the methods and means of warfare in order to limit human suffering during armed conflicts. Under its fundamental principles, it prohibits weapons and tactics that cause superfluous harm or unnecessary suffering, as well as those that do not distinguish between civilians and combatants. This prohibition applies not only to the use of weapons with inherently indiscriminate characteristics, but also to certain specific methods of conducting hostilities.

As such, several categories of weapons have been banned. These include cluster bombs, which were banned by the 2010 Oslo Treaty, anti-personnel mines, prohibited by the 1997 Ottawa Convention, nuclear weapons, with the adoption of the Treaty on

⁵⁸ Kenneth Anderson and Matthew C. Waxman, “Law and ethics for autonomous weapon systems: why a ban won’t work and how laws of war can”, *American University Washington College of Law Research Paper No. 2013-11*.

⁵⁹ *Ibid.*

the Prohibition of Nuclear Weapons in 2017, and the Chemical Weapons Convention, signed in Paris in 1993.

47. In this drive to limit the means of warfare, international attention has turned to lethal autonomous weapons systems, often referred to as “killer robots.” In fact, as early as 2013, several NGOs, notably Human Rights Watch, took up the issue and launched the “Stop Killer Robots” campaign, which already called for “*a preventive ban on the development, production and use of fully autonomous weapons.*”⁶⁰

48. These technologies still raise serious legal, ethical and security concerns. In fact, entrusting machines with the ability to decide, without direct human intervention, whether to use lethal force,⁶¹ *i.e.* whether or not to kill an individual, raises major questions about compliance with the principles of distinction, proportionality and responsibility in international humanitarian law, which we will discuss further below.⁶²

B) Article 36 of Additional Protocol 1

1- Examination of the lawfulness of defensive AIS

49. Article 36 of Additional Protocol I to the Geneva Conventions plays a crucial role by imposing a legality review for any new weapon, including AI-based systems. This article states that “*In the study, development, acquisition or adoption of any new weapon,*

⁶⁰ Human Rights Watch, “Killer Robots”, available at [Link].

⁶¹ Amnesty International, “Which weapons are prohibited under international humanitarian law?” available at [Link].

⁶² See below, paragraphs 54 *et seq.*

*means or method of warfare, a High Contracting Party shall have the obligation to determine whether its use would be prohibited, in certain circumstances or in all circumstances, by the provisions of this Protocol or by any other rule of international law applicable to that High Contracting Party.*⁶³ In this sense, it is the responsibility of States to determine whether the use of a new method of warfare, such as the use of Artificial Intelligence in armed conflicts, could be prohibited or not. Several States have already taken a stand on this issue, such as the United States and the United Kingdom, by “*refusing to adopt fully autonomous lethal systems.*”⁶⁴ However, this is only one aspect of AI-enabled systems. AI could also be considered as a technology for targeting humans without the lethal dimension. This is notably the case with the AI system used by the Israeli army in the Israeli-Palestinian conflict with their programme called Lavender. However, instead of banning these systems, it might be possible to programme artificial intelligence systems used in operational contexts to comply with the requirements of IHL, a point of view that we will discuss below (nos. 57 to 60). Thus, these “*new means of warfare*”⁶⁵ would meet the legal scrutiny of Article 36 of Protocol No. 1 of the Geneva Conventions.

⁶³ Article 36 of the Additional Protocol to the Geneva Conventions of 12 August 1949 relating to the protection of victims of international armed conflicts (Protocol 1), of 8 June 1977.

⁶⁴ Nevejans, Nathalie, “The legality of war robots in international conflicts,” *Recueil Dalloz* 2016, p. 1273.

⁶⁵ Smarandescu, Ioana-Alexandra and Varzaru, Nina-Maria, “The new means of waging war. Artificial intelligence in the field of international humanitarian law”, *Romanian Journal of International Law*, RJIL No. 30/2024, pp. 35-54.

50. As mentioned above, it is necessary to distinguish between AI technology, which does not in itself constitute a weapon and does therefore not fall legally within the scope of Article 36, and an AI device integrated into a weapon. In the latter case, if we consider that certain AI technologies are used for military purposes and involve operating conditions that can be regarded as methods and means of warfare, legal scrutiny stipulated by Article 36 is required. Therefore, in its opinion on the use of Artificial Intelligence technologies by the armed forces, the French Defence Ethics Committee advocates in its recommendation No. 1 that *“this review should be conducted, as necessary, during the various phases of a weapon system’s life cycle: during the R&D and manufacturing phases, but also during operational use.”*⁶⁶

2- *Review of the legality of weapons incorporating AI software in their assessment*

51. The requirement of Article 36 should also extend to existing weapons when they undergo a substantial modification, in particular through the integration of AI software, which could potentially turn them into a new weapon for a completely different use. Indeed, as Joanne Kirkham points out, *“any weapon undergoing a substantial modification should necessarily be subject to a new review procedure.”*⁶⁷ The addition of AI can significantly alter the operational characteristics of a weapon, particularly in terms of

⁶⁶ Defence Ethics Committee, “Opinion on the use of artificial intelligence technologies by the armed forces”, 14 January 2025.

⁶⁷ Joanne Kirkham, thesis “Lethal autonomous weapon systems: a study in international law”, defended on 10 December 2022, p. 99, paragraph 123.

autonomous decision-making, information processing speed and target engagement, all of which calls for rigorous review under international humanitarian law. In this regard, the integration of Hellfire missiles into Predator UAVs is a case in point. These drones, initially designed for surveillance missions, acquired a lethal dimension when they were equipped with these missiles.⁶⁸ However, the condition of lawfulness does not apply to surveillance systems, so it is “*easy to arm them, effectively transforming them into weapons, without ever having passed the test.*”⁶⁹ Therefore, pursuant to Article 36, this transformation should have led to a reassessment of compliance of their operating conditions with international law.⁷⁰

52. The integration of AI into a weapons system raises the question of the autonomy of these devices, which, according to Nathalie Nevejans, is defined by their ability to function without direct human intervention.⁷¹ The autonomy of AI-based weapons systems can be viewed as a continuum in which systems vary according to the degree of human control, the latter not being absolute but modulated according to the phases of weapon

⁶⁸ Must Paris, “MQ-1 Predator – Role and evolution of the US combat drone,” 1 December 2024, available at: [[Link](#)], accessed on 27/04/2024.

⁶⁹ Jean-Baptiste Jeangène Vilmer, “Lethal Autonomous Robots: The Beginning of a Debate,” December 2012. Available in PDF format.

⁷⁰ The above-mentioned article states that “The United States has accepted the obligation to assess the legality of its new weapons (in a directive in the Defence Acquisition Guidebook since 2003), but there is no indication at this stage that it would ban weapons that are advantageous but of questionable legality.”

⁷¹ Nathalie Nevejans, “The legality of war robots in international conflicts” (EA No. 2471).

engagement.⁷² It therefore becomes crucial to determine whether a human retains the ability to intervene to stop or modify the action of these systems, thereby ensuring that the use of such weapons does not contravene the principles of international humanitarian law and would therefore be lawful under Article 36. Furthermore, the concept of “*meaningful human control*”⁷³ requires that human interaction with these systems should not be limited to marginal supervision but involve the possibility of effective intervention at each key stage of the targeting and engagement process.⁷⁴

53. Finally, in accordance with the spirit of Article 36, the legality assessment does not only concern the conformity of a weapon in a static context, but must also take into account the concrete modes of employment. Thus, a weapon that was initially deemed to comply with the rules of international humanitarian law could, as a result of modification, become unlawful if its employment changes substantially. This is particularly relevant when the integration of AI gives the weapon increased decision-making autonomy, as could be the case with weapons capable of making firing decisions without direct human intervention, namely LAWSs. This type of change requires ongoing review of the legality

⁷² Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, “Report of the Group of Governmental Experts on Emerging Technologies in the Field of Lethal Autonomous Weapons Systems on its 2021 Session,” 22 February 2022.

⁷³ Webinar of United Nations, Office for Disarmament Affairs, “Experts Reflect on Novel Approaches to ‘Meaningful Human Control’”, 7 March 2023. Available at [[Link](#)].

⁷⁴ Campaign Stop Killer Robot, Briefing Note, “Maintaining Control over Weapons Systems.” Available in PDF format at [[Link](#)].

assessment to ensure that the system remains consistent with the fundamental principles of the law of war, in particular distinction and proportionality.⁷⁵

§ 2. *Principles of Distinction, Proportionality and Precaution*

54. To understand how international humanitarian law can regulate the use of AI in armed conflicts, it is essential first to examine its fundamental principles, in particular those of distinction, proportionality and precaution, which guide military activities and derive directly from the tradition of the law of war, *jus in bello* (see Section 1).

A) *The principle of distinction*

55. The principle of distinction “*The conflicting parties must at all times distinguish between the civilian population and combatants, as well as between civilian property and military targets, and therefore direct their operations only against military targets.*”⁷⁶ In an international armed conflict, combatants are authorised to take direct part in hostilities, which means that they may carry out legitimate acts of war to achieve a military objective effectively. However, the principle of distinction requires that these actions target only enemy combatants and military targets, while limiting unnecessary and excessive harm to civilians.⁷⁷

⁷⁵ CCAC, Convention on Certain Conventional Weapons (CCW), Report of 22 February 2022, *op.cit.*

⁷⁶ Additional Protocol to the Geneva Conventions relating to the Protection of Victim of International Armed Conflicts (Protocol I), 1977, Art. 48.

⁷⁷ International Committee of the Red Cross, “Means and Methods of Warfare” available at: [[Link](#)]

56. **Ineffective distinction.** Therefore, in light of the principle of distinction as defined in international humanitarian law, it appears that the inability of lethal autonomous robots to reliably distinguish between combatants and civilians could render their use legally unlawful. Indeed, the risk of civilians being targeted due to targeting errors attributable to automated systems⁷⁸ constitutes a serious violation of this fundamental principle.

57. **Programming for distinction.** On the other hand, if we can program lethal autonomous robots to comply with IHL requirements, then their use would be fully compliant and would even allow, “*in certain contexts, technology to offer greater precision.*”⁷⁹ Indeed, Christof Heyns, former rapporteur for the United Nations General Assembly, said as early as 2013 that “*robots have the ability to act cautiously and only fire in response. Furthermore, in some cases, the powerful sensors and information processing capabilities of UAVs can help soldiers see more clearly through the ‘fog of war’, thus preventing the kind of errors that often lead to atrocities in armed conflicts and saving lives.*”⁸⁰ We could therefore envisage that AI-enabled systems could comply with this principle of distinction, which is an essential principle of IHL. However, the opposite argument could also be considered. For the purposes of this study, this examination will be carried out in the technical section.⁸¹

⁷⁸ Anthony Cardia, “Armed conflicts in the age of artificial intelligence,” 26 November 2024. Available at [[Link](#)].

⁷⁹ United Nations General Assembly, Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, 9 April 2013.

⁸⁰ *Ibid.*

⁸¹ See Section 1, para. 65 *et seq.*

B) *The principle of proportionality*

58. The principle of proportionality is defined by the Additional Protocol to the Geneva Conventions relating to the protection of victims of international armed conflicts as a principle that “*prohibits attacks that may be expected to cause incidental fatalities among the civilian population, injury to civilians, damage to civilian property, or a combination thereof, which would be excessive in relation to the concrete and direct expected military advantage.*”⁸²

59. On this principle, the General Rapporteur of the United Nations Commission pointed out that “*the inability of lethal autonomous robots to understand the situation and place it in context could result in a robot deciding to launch an attack based on an incomplete and erroneous reading of the circumstances. However, it should be borne in mind that this can also be the case with humans.*”⁸³

60. In this sense, if we accept that individuals can also make mistakes during military operations, and that machines are likely to make similar errors, it seems difficult to justify banning them. It therefore seems reasonable to consider that certain weapons systems, provided they are programmed in accordance with the principles of IHL and used exclusively in strictly controlled situations, could be compatible with this legal framework. This opinion is defended in particular by Ronald Arkin, who argues that “*there are reasons to believe that in the future, robotic systems will be able to*

⁸² Protocol I Additional to the Geneva Conventions relating to the Protection of Victims of International Armed Conflicts, 1977, Art. 51(5)(b) and 57(2)(iii).

⁸³ United Nations General Assembly, Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, 9 April 2013.

*pierce the fog of war more effectively than humans could ever do.*⁸⁴ Therefore, it is precisely because humans make mistakes, commit crimes and are subject to strong emotions, and because robots are neutral, that it would be more moral and therefore preferable to send only them in the field. R. Arkin goes even further, saying that *“it may eventually be possible to create intelligent autonomous robotic military systems capable of reducing civilian casualties and material damage compared with the performance of human combatants.”*⁸⁵ Thus, reducing the number of civilian casualties would be in line with the IHL principles.

61. Still with a view to programming AIS to comply with IHL, the Defence Ethics Committee has published an opinion listing various *“possible uses for the armed forces,”*⁸⁶ covering a wide range of activities, whether or not the artificial intelligence systems are embedded in platforms and weapons. These cases include applications such as *“operational preparation support”*, *“intelligence support”*, *“surveillance and security support”*, and *“decision support, or even combat decision-making.”* Targeting, which also appears on this list, could thus, within the framework of programming that complies with IHL, be regulated and, consequently, be considered a lawful use of these technologies.

⁸⁴ Ronald Arkin, “Lethal Autonomous Systems and the Plight of the Non-combatant”, No. 137, July 2013.

⁸⁵ *Ibid.*

⁸⁶ Defence Ethics Committee, “Opinion on the use of artificial intelligence technologies by the armed forces”, 14 January 2025.

C) *The precautionary principle*

62. Provided for in Article 57(1) of Additional Protocol I, the precautionary principle stipulates that *"military operations should be conducted with all practicable care to ensure that the targets to be attacked are not the civilian population or civilian property,"*⁸⁷ or categories of persons protected under the Geneva Conventions.

63. This principle is based primarily on ethical and human judgement, implying the need for human control. However, the use of LAWSs and Artificial Intelligence is not in itself incompatible with this principle. Actually, in order to comply with this requirement, *"the action of LAWSs must be predictable. Users must be able to adjust or cancel the effects of weapon systems if necessary, which is only possible if the action and reaction of these systems can be reasonably anticipated."*⁸⁸ Therefore, if an AIS is completely transparent and can be explained at all stages of its life cycle, it could well comply with the precautionary principle. Furthermore, in the case of a simple AI targeting system that does not go so far as to kill a potential target, human control is normally indisputable since it is the human who makes the decision whether or not to kill. Nevertheless, it appears that human control is not so obvious in these simple systems, as will be seen below⁸⁹.

⁸⁷ Article 57 (1) of Additional Protocol I to the Geneva Conventions of 12 August 1949 relating to the protection of victims of international armed conflicts, 8 June 1977.

⁸⁸ Council of Europe, Committee on Legal Affairs and Human Rights, "The emergence of lethal autonomous weapons systems (LAWSs) and their necessary apprehension by European human rights law," Draft resolution adopted unanimously by the Committee on 14 November 2022.

⁸⁹ The case of human-supervised human targeting AIS, para. 160 *et seq.*

Chapter 2: The challenges of integrating a human targeting AIS into IHL

64. The introduction of artificial intelligence systems into targeting operations raises many challenges in terms of compliance with international humanitarian law. These challenges are primarily technical (Section 1) but also geopolitical (Section 2).

Section 1: Technical difficulties

65. The integration of AI systems into military targeting functions faces significant technical limitations. On the one hand, these systems have cognitive and decision-making shortcomings that compromise their ability to understand complex environments and to respond in a manner consistent with the requirements of IHL (§1). On the other hand, their operational deployment raises concrete risks, particularly in terms of algorithmic bias and vulnerability (§2).

§ 1. The cognitive and decision-making limitations of Artificial Intelligence systems

A) The opacity and unpredictability of artificial intelligence systems

1- AI algorithms used by the armed forces

66. **Weak AIs.** Firstly, there is currently only one type of AI: “weak” AI. This is AI that can be programmed by humans. This type of AI enables to perform specific tasks and is therefore considered intelligent, as the algorithm can independently solve a task that has been assigned to it.

Weak AI has contributed to several specific tasks such as facial recognition, voice recognition, etc.⁹⁰

67. **Strong AIs.** Furthermore, with the increasingly rapid growth of data and the colossal investments being made in AI, another type could potentially emerge. This is known as “strong” AI. This type of AI is not yet a concrete reality, but according to scientists, strong AI would be capable of imitating human intelligence and reasoning. Therefore, “*a properly programmed computer is truly a mind*”⁹¹ that thinks and can make decisions on its own, solving problems on its own as a human would.

68. Thus, in the not-too-distant future, strong AIs will truly be artificial “intelligences” in that they will be capable of solving all types of problems. Jean Mosconi even goes so far as to say that “*Any human behaviour that can be accurately described can be simulated by a suitably programmed computer.*”⁹² As a consequence, these AIs, like human intelligence, will be subject to the principles of IHL.

69. **Artificial superintelligence.** Some even believe that there is a third type of AI: artificial superintelligence.⁹³ These totally

⁹⁰ Blog article, Datasulting, “Algorithms, Artificial Intelligence, Machine Learning, Deep Learning: what are the differences?”, 22 June 2023. Available at [\[Link\]](#).

⁹¹ Patrick Goutefangea, “Alan Turing and artificial intelligence: the ‘limitation game’ and ‘strong AI’”, 24 June 2017, Hal open science. Available at: [\[Link\]](#).

⁹² Jean Mosconi, “On some abilities and inabilities of Machines,” *Bulletin of the French Philosophical Society*, 3, July-September 1991, p. 86. Quoted by Patrick Goutefangea, *op. cit.*

⁹³ Tim Mucci and Cole Stryker, “What is artificial superintelligence?”, IBM, 18 December 2023. Available at [\[Link\]](#).

futuristic forms of AI would surpass human intelligence. In this scenario, *artificial superintelligence* would no longer imitate humans, but would become a new species, a “digital species.”

70. Overall, the scientific community agrees that there are two types of AI: weak AI, which we are currently familiar with, and strong AI, which is an ideal for some and a dystopia for others.

71. The components of AI. In the field of artificial intelligence, machine learning (ML) is an essential subset. It is based on the ability of machines to learn from data, through a training phase in which the system “*learns implicit rules based on this data*,”⁹⁴ without being explicitly programmed for each task. ML encompasses several types of learning: supervised, based on data labelled by humans; self-supervised, where the system generates the labels itself; and reinforcement learning, in which the agent learns by trial and error based on rewards or punishments.

Deep learning (DL) is a branch of machine learning that relies on artificial neural networks composed of many successive layers. This type of learning is particularly effective for processing complex and unstructured data, such as images or language. Today, Deep Learning is commonly used in the development of autonomous vehicles,⁹⁵ and by extension, it could be applied to lethal autonomous weapons systems.

⁹⁴ Ludovic De Matteis, Steeven Janny, Solal Nathan and Wenqi Shu-Quartier, “Introduction to Machine Learning”, École Normale Supérieure, Paris-Saclay, published on 24/05/2022. Available at [\[Link\]](#).

⁹⁵ Muhammad Tuhin, “7 examples of How Deep Learning Is Used Today”, *Science News Today*, 30 April 2025. Available at [\[Link\]](#).

72. The transition from classical ML to DL marks a significant break in the way models process data. While traditional approaches still relied heavily on human intervention for the selection of relevant features and the prior structuring of data, deep learning now allows algorithms to extract complex and relevant representations themselves, without requiring human assumptions about the nature or structure of the information being processed.⁹⁶

73. These two subsets, machine learning and deep learning, constitute AI and are therefore used in the creation of military AISs. The International Committee of the Red Cross is particularly interested in the use of machine learning in warfare. For the ICRC, *“AI and machine learning software – particularly software developed for ‘automatic target identification’ – could become the basis of future autonomous weapons systems, adding a new dimension of unpredictability to these weapons.”* Furthermore, the ICRC admits that this type of software could also be used to develop non-lethal systems which would merely assist in targeting decisions.⁹⁷

2- Transparency of algorithms: the “black box” effect

74. Challenge. The transparency of artificial intelligence algorithms, particularly those based on machine learning and more specifically deep learning, is now a scientific, technical and ethical challenge of the first order. Actually, while AI systems achieve

⁹⁶ Auguste Lehuger, “Recent Applications of Machine Learning”, Master 2 Course on Artificial Intelligence Law.

⁹⁷ ICRC Position Paper: Artificial intelligence and machine learning in armed conflict: A human-centred approach, March 2021. Available at [\[Link\]](#).

remarkable performance in various fields, they nevertheless have a major structural flaw: their intrinsic opacity.⁹⁸

75. Definition. This phenomenon, often referred to as the “black box problem”, refers to the inability, even for designers, to understand or explain in an intelligible way the reasoning behind an algorithmic decision. As the Villani report points out, “*the transparency of learning-based systems is therefore a real scientific challenge.*”⁹⁹ Unlike traditional deterministic programmes, where decision rules are explicit, traceable and understandable, machine learning models rely on the management of millions of parameters, particularly in deep neural networks, operating in very high-dimensional data spaces. This complexity makes it virtually impossible to identify the determining variables that led to a given decision, particularly in individual cases.

76. The lack of transparency not only raises cognitive barriers for users and regulators, but also entails considerable ethical and legal risks. The opacity of systems can conceal the origin of discriminatory biases, making it impossible to determine whether they stem from the algorithm, the training data, or an interaction between the two. As Professor Marie-des-Neiges Ruffo points out, “*the use of machine learning can potentially leave the way in which the machine made its decision in a 'black box', in other words, opaque,*”¹⁰⁰ thus paving

⁹⁸ Maël Pégny, Mohamed Issam Ibnouhsein, “How transparent should machine learning algorithms be?”, May 2018, pp.7-8.

⁹⁹ Cédric Villani, “Giving meaning to artificial intelligence”, report dated 28 March 2018.

¹⁰⁰ MdN Ruffo, “Do we have a choice in using AI in wartime?” *Cahiers de la sécurité et de la justice*, issue 47, 12 March 2020. Available at [\[Link\]](#)

the way for abuses where the lack of technical explanation could serve as a pretext for the lack of legal justification.¹⁰¹

77. The opacity of lethal autonomous weapons systems.

These issues become particularly critical when it comes to autonomous weapons systems. The use of opaque decision-making processes in military contexts raises a series of fundamental questions about responsibility, compliance with international humanitarian law and the ethics of lethal force delegation. In a context of armed conflict, the inability to trace the logic behind a strike or an autonomously selected target undermines the ability to establish legal responsibility and of correcting, preventing or even recognising technical or moral errors. Therefore, the lack of transparency cannot be considered a mere technical limitation, but rather a systemic constraint that could weaken the very foundations of human governance over armed force.

78. Human control. In this context, setting up a meaningful human control over AI systems deployed in sensitive situations, particularly military ones, appears to be an essential precautionary principle. This control would aim to ensure the traceability, understanding and, where appropriate, justification of decisions made by autonomous systems, in order to achieve accountability and compliance with the existing regulatory framework. This is exactly what Recommendation No. 7 of the Defence Ethics Committee advocates, stating that “*Military training must promote an understanding of transparency documents and, above all, promote their ability*

¹⁰¹ *Ibid.*

*to detect when the function performed by Artificial Intelligence technology is degraded, damaged or insufficient and that it is necessary to take back control.”*¹⁰² The training of military personnel recommended by the Defence Ethics Committee is in line with the principle of AI control set out in Article 4 of the European Regulation on Artificial Intelligence, which requires managers using AISs to train their staff on the operation and use of AISs in the context in which they are required to use them.¹⁰³

B) The inability of AI to interpret the legal principles of IHL

1- Reliability

79. Definition of reliability. The use of Artificial Intelligence, based mainly on algorithms and mathematical processing, raises specific issues regarding the reliability of the systems that incorporate it. The ISO/IEC TS 5723 standard defines reliability as “the *ability of an item to operate as required, without failure, for a given period of time and under given conditions.*”¹⁰⁴ This definition emphasises the consistency and stability of the performance expected from a system. In the same vein, Dominique Lambert, ScD & PhD, specifies that the reliability of a system depends on the

¹⁰² Defence Ethics Committee, “Opinion on the use of artificial intelligence technologies by the armed forces”, 14 January 2025. Available in PDF format.

¹⁰³ Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Regulation on artificial intelligence).

¹⁰⁴ Technical specification, ISO/IEC TS 5723, “Trustworthiness – Vocabulary”, First edition, 2022-07. Available in PDF format at [\[Link\]](#).

predictability of its behaviour in all the environments in which it is intended to operate.¹⁰⁵

80. The reliability of a human targeting AIS. If we were to take this definition and apply it to a military human targeting AIS, it would amount to defining it as the ability of this system to target one or more individuals previously registered by those commissioning the action.

81. Reasons for this unreliability. This unreliability of artificial intelligence algorithms can be the result of several causes. Indeed, especially in an operational context, algorithms must be able to withstand climatic, electrical and enemy interference, etc. Autonomous targeting UAVs must therefore be able to function even in the event of jamming (GPS or other) or damaged sensors. For human targeting systems incorporating AI, this means that they must not lose contact with the human commander directing them. Furthermore, unreliability can also stem from the poor quality of the data used to train the AI system. This problem can be particularly acute in a military context, where data is scarce or classified.

82. Unreliability applied to military AISs. A key question emerges in debates on the use of artificial intelligence in a military context: *“Given a general algorithm and a set of data fed into it, can we ensure that this algorithm will produce responses that are acceptable in view of*

¹⁰⁵ Dominique Lambert, “Robotics and artificial intelligence”, Collection Que penser de... ? p. 55.

the criteria defined by the designers?,”¹⁰⁶ emphasises Dr Lambert. Applied to AI in an operational military context, we have seen that it would be possible to programme AISs to comply with IHL. But this question casts doubt upon that thesis. It would amount to asking another question: could the criteria of proportionality, precaution and distinction, which are fundamental to IHL, be respected by the machine? In fact, these principles involve not only contextual analysis, but also value judgements and normative interpretations, which AI systems are currently incapable of performing autonomously. Based on statistical algorithms, these systems have no understanding of the ethical context or access to the moral or legal nuances that these principles require.

83. The case of S. Petrov. This limitation is perfectly illustrated by the famous case of Stanislav Petrov, a Soviet officer who, on 26 September 1983, refused to launch a nuclear retaliation despite an alert from an “Oko” system signalling an American attack. Thanks to his human judgement, and in particular after a thorough examination lasting around 17 minutes,¹⁰⁷ Petrov concluded that the signals detected were probably faulty, which proved to be correct. An AI system, even one that is technically reliable, could have obeyed the programmed logic without questioning the validity of the data or assessing its strategic plausibility or the real intention of the adversary. Thus, by challenging the system, Petrov showed that effective human intervention is not simply a matter of “staying in the loop” but of

¹⁰⁶ *Ibid.*

¹⁰⁷ *The Russian who saved the world*, article on the Watson internal website, 2024/04/14. Available at [[Link](#)].

being able to question the machine's results, challenge them or disobey the protocol.¹⁰⁸ And it was precisely this mistrust of the machine and this human ethical judgement that prevented a global catastrophe caused by the machine. This was also reiterated by the Group of Governmental Experts on LAWs, which explained that *“human judgement is essential to ensure that weapons systems based on emerging technologies in the field of lethal autonomous weapons systems will potentially be used in accordance with international law and, in particular, international humanitarian law.”*¹⁰⁹

84. Thus, the reliability of a military system cannot be reduced to its proper algorithmic functioning. It must include the capacity for legal and moral interpretation in ambiguous and critical situations, *i.e.* human control, since, according to the ICRC, *“it is humans – not machines, computer programmes or weapons systems – who apply the law and are bound to comply with it.”*¹¹⁰

This case shows that the reliability of an AI system in no way guarantees its operational or legal legitimacy, especially when it comes to complying with the constraints of international humanitarian law.

2- Robustness

85. Definition. One of the fundamental limitations of artificial intelligence algorithms lies in their robustness. The French Data

¹⁰⁸ Antón Barba-Kay, “There Is No Ethical Automation: Sanislav Petrov’s Ordeal by Protocol”, *Journal of Military Ethics*, 2024, Vol. 23, No. 3-4, pp. 277-288. Available in PDF format.

¹⁰⁹ CCW/GGE.1/2019/3. Available at [\[Link\]](#)

¹¹⁰ ICRC, “A new step towards imposing limits on the autonomy of weapons systems”, 12/04/2018. Available at [\[Link\]](#).

Protection Authority (CNIL) has defined this concept as “*the ability of the system to maintain its compliance with performance and/or security requirements in the presence of input data outside its area of employment, for example due to a sensor defect.*”¹¹¹

86. Example. In this context, Dominique Lambert provides us with an example. A pattern recognition algorithm is considered robust if it provides identical results when confronted with data that is slightly different but invisible to the human eye.¹¹² This concept is crucial in the context of the use of Artificial Intelligence systems for military targeting applications, in particular automatic systems for the targeting of individuals.

87. Application to human targeting AISs. Human targeting AISs are generally designed to identify specific individuals in complex environments, often for military purposes. Their objective is to distinguish legitimate targets, such as enemy combatants, from civilians. However, these systems can be vulnerable to attacks by adversaries, such as decoys, in which the enemy deliberately introduces disruptions into the data. For example, an enemy soldier could wear an unconventional uniform, such as a pink uniform, to deceive the targeting system.¹¹³ This form of manipulation could lead to misclassification, in which a civilian, mistaken for an enemy combatant, would not be recognised as a harmless target. Such a situation could compromise

¹¹¹ Definition of robustness in artificial intelligence by the CNIL.

¹¹² *Op. cit.* p.56

¹¹³ Example taken from Laure de Roucy-Rochegonde’s book, *War in the age of artificial intelligence*, p.132, reworded and adapted to our argument.

the effectiveness and accuracy of missions, or even lead to tragic consequences, including unjustified civilian casualties.

88. Conversely, if a targeting AIS is retrained based on this anomaly, *i.e.*, if it learns that the pink uniform can be associated with an enemy combatant, to take our example, the system could then classify a civilian wearing clothing of that colour as a legitimate target, raising serious ethical and operational concerns. This process of relearning data, while it may improve the robustness of the system in some contexts, can also make the situation worse if the algorithm learns erroneous associations.

89. Scenario with human supervision. In scenarios where a human targeting AIS is under direct control of the operator, human supervision provides a form of safeguard, because the human operator remains responsible for the final decision, in this case whether or not to fire on the target identified by the system. This human supervision capability helps maintain a certain ethical and operational rigour, ensuring that possible classification errors do not lead to irreversible actions.

90. Scenario without human supervision. However, when it comes to autonomous lethal weapons systems, human supervision becomes less obvious, or even non-existent. In this case, a fully autonomous AIS could, for example, identify a civilian it has mistakenly classified as a combatant and decide to open fire without human intervention. This lack of human control raises major ethical and legal questions, particularly with regard to compliance with the principles of international humanitarian law, since one of the major principles of IHL is the principle of

distinction between civilians and combatants, and also the need to limit the effects of armed conflict to legitimate military objectives. In such a scenario, the use of autonomous systems that are beyond human control could directly disagree with these fundamental principles.

91. The “non-robustness” of Artificial Intelligence algorithms poses serious challenges in the case of war scenarios involving the use of AI, where rapid and accurate decision-making is essential. The absence of human supervision, particularly in the context of LAWs, could result in serious violations of human rights and international norms, jeopardising the legitimacy and morality of the use of these technologies in a military context.

§ 2. Practical risks associated with the operational use of AI in a military context

A) Data bias and errors in target identification

92. In the field of human targeting AI systems, bias in artificial intelligence systems takes on a particularly critical dimension.

93. Definitions. From a technical point of view, according to Chiara Lindloff and Ingo Siegert, bias describes an input modulation in neural networks.¹¹⁴ In their study on the definition of bias in AI systems, the authors suggest identifying two distinct categories of bias. On the one hand, there is technical bias, which is “*a neutral architectural concept referring to input modulation in neural*

¹¹⁴ Chiara Lindloff and Ingo Siegert, “Defining bias in AI systems: Biased models are fair models”, 25 February 2025.

networks”¹¹⁵ and, on the other hand, there is social bias, which is “*fair differentiation that recognises differences relevant to the outcome*.”¹¹⁶ In our study, we will focus on this definition of bias, which is defined as “*the systematic errors that occur in decision-making processes, leading to unfair outcomes*.”¹¹⁷ The risks of bias are due to a multitude of factors, which we will detail below.

94. Biased training sample. The first bias stems from the fact that the training sample is biased. In other words, when training AI, the system is trained on a biased data sample. For example, if we were to operate an AI such as ChatGPT using world literature as a training sample and ask it about the difference between men and women, the AI might produce statistically misogynistic responses. Ultimately, training an AI on biased samples would not lead to a good solution, or at least not a satisfactory one.

95. Application to human targeting AIS. A biased training sample could lead to poor target identification. For example, if an autonomous weapon system has been trained with data primarily derived from certain cultural or geographical environments, it could be less accurate, or even discriminatory, towards under-represented populations, thereby increasing the risk of unjustified firing.

¹¹⁵ *Ibid.*

¹¹⁶ *Ibid.*

¹¹⁷ Emilio Ferrara, “Fairness and Bias in Artificial Intelligence: A Brief Survey of Sources, Impacts, and Mitigation Strategies,” 26 December 2023.

96. Bias from the outset. Next, there may be biases that can be introduced as early as the designing phase of the algorithm. Design biases can be dramatic. As with the COMPAS algorithm,¹¹⁸ used in the legal field, which reproduced racial biases, an autonomous weapon system could incorporate the unconscious biases of its designers, affecting target selection and engagement decisions, without this being intentional at the outset.

97. Biased environment. Then there are AIs that are exposed to a biased environment. This can distort the decisions of the embedded AI: just as the TAY case¹¹⁹ showed how an AI could be quickly corrupted by a toxic environment,¹²⁰ a LAWS placed in a chaotic or conflictual context could misinterpret human behaviour, resulting in unjustified strikes.

98. Operating bias. Finally, there may be bias due to the functioning of AI, its structure and, in particular, its statistical nature. Operating bias and the statistical nature of AI highlight a fundamental limitation: AI does not understand, it correlates. Just as AI confused a husky with a wolf¹²¹ because of the presence of snow, military AI could misinterpret contextual signals on the

¹¹⁸ The COMPAS algorithm for Correctional Offender Management Profiling for Alternative Sanctions is an algorithm that uses machine learning methods to predict an individual's likelihood of reoffending. A 2016 investigation by ProPublica revealed that this tool contains racial biases.

¹¹⁹ TAY is a conversational chatbot created by Microsoft.

¹²⁰ TUAL, Morgane, "Barely launched, Microsoft's artificial intelligence slips up on Twitter" article published in *Le Monde*, 24 March 2016. Available at [\[Link\]](#).

¹²¹ The model confused wolves and huskies because it associated the snow in the background with the presence of a wolf. See "Why AI fails in nature", available at [\[Link\]](#).

ground (gestures, clothing, groups of people) and act incorrectly. These errors can never be completely eliminated because they are inherent in the statistical nature of machine learning.¹²²

B) Vulnerabilities to cyber-attacks and challenges

99. Artificial intelligence systems, particularly those used in military contexts for human targeting, whether fully autonomous or under human supervision, rely on complex and interconnected infrastructures. These systems are vulnerable to various types of cyber-attacks. Vulnerabilities can be defined as technical, software or structural flaws that an adversary can exploit¹²³ to alter the behaviour, performance or results of an autonomous system.

As Paul Scharre points out, “*once an adversary discovers a vulnerability in an autonomous system, they are free to exploit it until a human discovers the vulnerability and patches the system or modifies its use.*”¹²⁴ This shows how dangerous a vulnerability can be, especially in an operational context, since the machine cannot repair itself or self-adapt. This would therefore have terrible consequences on human targeting systems, which could, for example, turn “against their own side” as a result of a cyberattack. Furthermore, the fact that the human operator must be aware of the flaw, repair the algorithm, or even retrain it, means that the resulting delay in response can have disastrous consequences, particularly for civilians who may be targeted. In addition, a reassessment of

¹²² Lecture by Mr Raphael Dechaux, Master 1 Artificial Intelligence Law.

¹²³ IBM, “What is vulnerability management?” Available at [[Link](#)]

¹²⁴ Paul Scharre, *Army of None: Autonomous Weapons and the Future of War*, New York, W. W. Norton and Company, 2018, p.178.

legality could be necessary once the vulnerabilities have been corrected. (See paras. 51 to 53).

100. Multitude of cyberattacks. Cyberattacks can take many forms, ranging from input data manipulation, training data or model poisoning, privacy attacks, intrusion into communications networks, and denial-of-service attacks.

101. The implications of vulnerabilities for autonomous or supervised human targeting systems. Technical vulnerabilities and cyberattacks pose major challenges in the context of autonomous weapon systems. First, they compromise the reliability of these systems in military operations. A successful attack could disable a system, manipulate its targeting decisions, or even result in an unwanted escalation of the conflict.

Secondly, these vulnerabilities undermine legal accountability. Under international humanitarian law, compliance with the principles of distinction, proportionality and precaution is a fundamental requirement. However, AI whose behaviour has been altered by a cyberattack could violate these principles without the chain of command being aware of it or having effective control over it. This lack of traceability or intelligibility of errors also raises issues of accountability, which is one of the 11 guiding principles established by the Governmental Expert Group on emerging technologies in the field of LAWS.¹²⁵

¹²⁵ National Assembly, Information Report No. 3248 concluding the work of an information mission on lethal autonomous weapons systems, 22 July 2020.

Furthermore, the risk of technological proliferation to non-state actors, particularly terrorist groups, exacerbates the threat.¹²⁶ A hacked or hijacked system could be used against its original creators or against civilian populations, in total violation of IHL standards.

Finally, the risk of loss of operational control is heightened when human supervision relies on vulnerable communications. An attack disrupting the link between the AI and its operator could render any human attempt to regain control ineffective in the event of a failure.¹²⁷

102. Proposals to strengthen cybersecurity in human targeting AI systems. In the face of these threats, several avenues must be explored to ensure military-grade cybersecurity appropriate to the criticality of human targeting systems. Firstly, it is essential that AI systems are designed from the outset with a *secure by design* approach.¹²⁸ This involves integrating in-depth defence mechanisms, combining firewalls, anomaly detection and cryptographic checks.

Another solution would be to equip these systems themselves with AI-based self-defence mechanisms.¹²⁹ These

¹²⁶ *Ibid.*

¹²⁷ Mathias Comandré and Mattéo Mevellec, “The ethical challenges and risks of military artificial intelligence,” National Institute for Strategic and Political Affairs. Available at [\[Link\]](#).

¹²⁸ ANSSI, “Security Recommendations for a Generative AI System,” ANSSI-PA-102, 29/04/2024. Available at [\[Link\]](#)

¹²⁹ MdN Ruffo, “Do we have a choice about using AI in wartime?”, issue no. 47 of *Cahiers de la sécurité et de la justice*, 12 March 2020. Available at [\[Link\]](#)

mechanisms would enable real-time detection and countering of any attempt at intrusion, data manipulation, or sensor tampering.

Section 2: Geopolitical challenges

103. Beyond the technical challenges, the integration of military artificial intelligence systems is taking place in a tense geopolitical context. On the one hand, an arms race dynamic is fuelling accelerated innovation, often to the detriment of a clear and shared legal framework (§1); on the other hand, this strategic rivalry is having a detrimental effect on international stability, increasing the risks of uncontrolled escalation and proliferation (§2).

§ 1: The conflict between the arms race and the need for a regulatory framework for AI

104. Technological transformations in the military sphere, such as the advent of lethal autonomous weapons systems, are not simply a matter of technical progress, but also stem from political transformations. As Clausewitz points out, “*transformations in the art of war therefore stem from transformations in politics. Far from showing that they are dissociable, they demonstrate, on the contrary, their intimate union.*”¹³⁰ In this context, the arms race, particularly in the field of AI, must be balanced against the need to create a rigorous regulatory framework. It therefore seems essential that LAWSs be programmed in accordance with the principles of IHL, not only to comply with strategic considerations, but also to ensure that they

¹³⁰ Carl Von Clausewitz, *On War*, 1832, abridged edition presented by Gérard Chaliand, Tempus collection, Perrin editions, p. 402.

meet legitimate political objectives, respecting the ethics of war and fundamental human protections. This highlights the intimate union between politics and technology, where technical choices must be aligned with broader political objectives.

105. Thus, artificial intelligence, whether used alone or in combination with other emerging or disruptive technologies, has the potential to profoundly transform the nature and even the very essence of warfare.¹³¹ Its integration into military systems and processes constitutes a lever of strategic and political superiority that could profoundly disrupt the art of warfare. As some experts point out, “*the integration of AI into military systems has the potential to revolutionise warfare,*”¹³² highlighting the scale of the transformations to come. It is therefore clear that countries are rushing to participate in this race for military AI in order to take the lead in this “new style of warfare.”

106. At the European summit on artificial intelligence held in Paris on 10 and 11 February, the “*Paris Declaration on Maintaining Human Control over Artificial Intelligence-Enabled Weapons Systems*”¹³³ was signed by no fewer than 27 countries, including France, but notably absent were the United States, China and Russia. This

¹³¹ Payne Kenneth, “Artificial Intelligence and the Nature of War,” in: Sweijts Tim and Michaels Jeffrey H. (eds.), *Beyond Ukraine: Debating the Future of War*, Oxford University Press, 2024, pp. 223-240. Quoted by the *Revue Défense Nationale*, no. 879, April 2025.

¹³² Clement Sven, “NATO and AI: Navigating the Challenges and Opportunities,” *Special Report for Science and Technology Committee of NATO Parliamentary Assembly*, 24 November 2024, available at [\[Link\]](#).

¹³³ Paris Declaration on Maintaining Human Control in AI-Enabled Weapon Systems. Published 11 February 2025.

declaration shows how important the issue of AI-enabled weapon systems is in the field of defence.

107. Furthermore, recent events also show that the race for AI in military activities is underway. Very recently, Singapore and the French company Thales have created a joint laboratory dedicated to Artificial Intelligence, with the aim of strengthening the defence systems of the Singapore Armed Forces (SAF), particularly in the face of the growing threat from UAVs.¹³⁴

108. On 25 March 2025, the NATO Communications and Information Agency (NCIA) and Palantir agreed on the acquisition *of the Maven Smart System NATO*, an AI platform that assists in the analysis of operational data with a view to “*accelerating decision-making on the battlefield.*”¹³⁵ This system, designed for deployment within Allied Command Operations, represents a decisive step in the modernisation of the Alliance’s military capabilities and will provide it with “*cutting-edge, customized artificial intelligence capabilities, equipping our forces with the tools they need to operate effectively and decisively on the modern battlefield.*”¹³⁶ NATO's very recent acquisition of this system demonstrates the extent to which military organisations and countries are seizing the opportunity to equip their armed forces with AI.

¹³⁴ Thales Group, “DSTA and Thales announce joint AI lab to strengthen Singapore's defence systems,” published 4 April 2025.

¹³⁵ Sauveton, Pierre, “Military AI: NATO chooses Palantir, France responds with Artemis, GenIAL... and Comand AI.” Available at [\[Link\]](#).

¹³⁶ NATO Communications and Information Agency, 14 April 2025. Available at: [\[Link\]](#).

109. In addition to the fact that this race is undeniable, according to Paul Scharre, it is being fought on four battlefields: “*data, computing power, talent and institutions.*”¹³⁷ The global competition for AI-based weaponry involves several major powers, each investing heavily in research and development of this technology in order to gain a strategic military advantage. The United States and China occupy a dominant position in this dynamic, while other states are also making considerable progress in this field.

A) Countries running the race for AI in the military area

1- The United States

110. The United States is considered one of the most advanced countries in the field of artificial intelligence in defence activities, particularly in terms of investment, which amounts to billions of dollars. At the heart of this approach is DARPA (Defense Advanced Research Projects Agency), a programme specialising in innovation in new technologies, and the Joint Artificial Intelligence Center (JAIC), designated as the “Department of Defense (DoD) center of excellence in Artificial Intelligence.”¹³⁸ The JAIC’s mission is to steer the strategic integration of artificial intelligence within the US Department of Defense. It aims to fully exploit the potential of AI to enhance operational effectiveness, while ensuring an ethical, legal and secure use of these technologies. To

¹³⁷ Scharre Paul, *Four Battlegrounds—Power in the Age of Artificial Intelligence*, W.W. Norton & Company, 2023, 496 pages. Quoted by Laurent Saunois in the Revue Défense Nationale, No. 879, April 2025.

¹³⁸ Actu IA, “United States: the latest news on AI from the Pentagon and the Joint Artificial Intelligence Centre”. Available at: [\[Link\]](#).

this end, it supports research, develops common tools, trains personnel and strengthens partnerships to modernise military capabilities while protecting critical infrastructure.¹³⁹ The JAIC is actively working to integrate AI in the designing of tools such as a multi-service ‘war machine’ “*capable of combining rapid data analysis with real-time military action*”¹⁴⁰ to improve decision-making on the battlefield. This dedicated structure and these ambitious initiatives underscore the United States’ considerable investment and commitment to the defence AI race.

111. Par ailleurs, les États-Unis disposent d’une avance significative en matière de capacités de calcul, grâce à un avantage technologique marqué et à une maîtrise approfondie du cycle de production des semi-conducteurs. Aussi, leur capacité à attirer les talents, y compris parmi les chercheurs étrangers, renforce leur position dominante dans le domaine de l’intelligence artificielle.¹⁴¹

2- China

112. China, through its People's Liberation Army (PLA), plays a central strategic role in integrating artificial intelligence into its defence and militarisation strategies, actively participating in the global dynamics of the technological arms race in the military area. Since Lieutenant General Liu Guozhi’s 2017 statement predicting

¹³⁹ STIP COMPASS, Joint Artificial Intelligence Centre, last updated: 3 June 2024. Available at [[Link](#)].

¹⁴⁰ *Ibid.*

¹⁴¹ *Revue de Défense Nationale*, «Enjeux et Defis de l’Intelligence artificielle (IA) pour l’OTAN», n°879, Avril 2025.

that AI would bring about a major revolution in modern warfare,¹⁴² China has stepped up its efforts to position itself as a global leader in this field. This ambition is reflected in considerable investments, particularly in the development of autonomous weapons,¹⁴³ as well as in the creation of specialised research institutes that promote the development of AI-based weapon technologies.

113. As early as 2011, China already included in its official dictionary the definition of AI-enabled weapons as “*a weapon that utilises AI to pursue, distinguish, and destroy enemy targets automatically; often composed of information collection and management systems, knowledge base systems, decision assistance systems, mission implementation systems, etc.*”¹⁴⁴ This shows how strongly China was positioning itself on these issues.

114. In addition, the Chinese government has implemented a “civil-military fusion” strategy, aimed at maximising synergies

¹⁴² [人大代表刘国治：人工智能将加速军事变革进程], quoted by Dr Michel Valantin, “Militarisation of Artificial Intelligence in China”, The Red Team Analysis Society, 23 April 2018.

¹⁴³ AI, China’s new economic and geopolitical tool, article published on 6 February 2025 in the digital newspaper RFI

¹⁴⁴ 全军军事术语管理委员会 [All-Military Military Terminology Management Committee], 中国人民解放军军语 [People’s Liberation Army Military Terminology], (Beijing: 军事科学出版社 [Military Science Press], 2011). Quoted by Elsa B. Kania, “AI weapons” in China’s Military Innovation, April 2020. “A weapon that uses artificial intelligence to automatically pursue, identify and destroy enemy targets; it often consists of information gathering and management systems, knowledge bases, decision support systems, mission execution systems, etc.”

between civilian research and military needs.¹⁴⁵ This model allows for a seamless integration of civilian technological discoveries into military applications, thus accelerating the militarisation of emerging technologies such as unmanned aerial vehicles (UAVs), autonomous cruise missiles with advanced cognitive capabilities, and autonomous submarines.¹⁴⁶ These systems, which rely on machine learning algorithms and real-time decision-making processes, illustrate the convergence of civilian and military efforts under centralised state control, particularly under Xi Jinping's leadership.

115. The concept of “intelligentisation”, which is based on the automation of military operations by autonomous systems, is a key element in the modernisation of the PLA. The long-term goal is to transcend the concepts of “computerised” warfare and adopt “intelligentised” warfare,¹⁴⁷ in which strategic and tactical decisions are largely made by autonomous systems capable of adapting in real time to developments on the battlefield.¹⁴⁸ This change aims not only to increase operational efficiency, but also to strengthen China's power projection capabilities in order to support its geopolitical ambitions.

¹⁴⁵ Task Force Report, “Artificial Intelligence in support of Defence”, 2019.

¹⁴⁶ Dr Michel Valantin, “Militarisation of Artificial Intelligence in China”, The Red Team Analysis Society, 23 April 2018. Available at [\[Link\]](#).

¹⁴⁷ Elsa B. Kania, “The PLA’s trajectory from informatised to ‘intelligentised’ warfare”, 8 June 2017. Available at [\[Link\]](#).

¹⁴⁸ Dr Michel Valantin, “Militarisation of Artificial Intelligence in China”, The Red Team Analysis Society, 23 April 2018. Available at [\[Link\]](#).

116. In this dynamic, China not only develops AI capabilities for purely military purposes, but is seeking to establish dominance in AI research and innovation, and thus to use this technology as a strategic tool for military coercion, thereby amplifying its position on the world stage. Through this technological arms race, China is striving to acquire “AI power” in order to become a technological and military superpower, with the ambition of surpassing the United States in this field.¹⁴⁹

117. Cooperation mechanisms between the private sector and the Chinese state enable the effective centralisation of research efforts, particularly in the military. In this sense, the principle of “civil-military fusion” has become a strategic pillar of Chinese policy, promoting the integration of private industries into increasingly sophisticated defence projects. This approach reflects a vision firmly focused on the use of AI technologies for security and military purposes, with direct government involvement in the management and regulation of private actors.¹⁵⁰

3- *Europe/France*

118. Europe: an intermediate power. Alongside the two "superpowers" in this AI race, the United States and China, Europe is considered a middle power.¹⁵¹

Unlike the two superpowers, whose economic model is based on the data market and whose ecosystem is built around digital giants such as GAFAM and BATX, Europe is more

¹⁴⁹ Elsa B. Kania, *op. cit.*

¹⁵⁰ Task Force Report, 2019, *op. cit.*

¹⁵¹ *Ibid.*

cautious. However, its strength, but also its weakness, may lie in its strict stance on ethics and compliance with the law¹⁵² and, in particular, its firm commitment to compliance with international humanitarian law.

119. Furthermore, investment in AI varies significantly between individual European states and the United States or China, and this could be a determining factor in this military arms race. In order to compete with these colossal investments, Europe must show unity. For the rapporteurs of the fact-finding mission on lethal autonomous weapons systems, *“there is little doubt that it is at the European level that national and European strategic autonomy in the digital field, and consequently in the field of artificial intelligence for defence, is at stake. The issues at stake go far beyond the national sphere.”*¹⁵³

120. Challenges in this race for military AI also appear in the field of technology and military companies. It is essential that Europe once again becomes a welcoming place for large technology companies, particularly in the field of defence, in order to be able to compete effectively with powers such as the United States and China. In this regard, several joint projects in the field of defence artificial intelligence, such as the MGCS (Main Ground Combat System), SLAM-F (Future Mine Countermeasures System), FCAS (Future Combat Air System) and the Space Situational Awareness programme, offer opportunities to

¹⁵² *Ibid.*

¹⁵³ French National Assembly, Information Report No. 3248, *op. cit.*

strengthen a common European strategic vision on AI-related issues.¹⁵⁴

121. Position of European countries on LAWSs.

Furthermore, on the issue of LAWSs, the French National Assembly's report on lethal autonomous weapon systems provides insight into some of the common positions of EU member states.¹⁵⁵ Austria is campaigning for a legally binding instrument imposing substantial human control over the critical functions of LAWSs. Finland supports a ban on the development and production of AI-based weapons systems, while recognising the inevitable evolution of autonomy in military systems. Italy defends the importance of human control as a guarantee of compliance with IHL and considers the CCW to be the legitimate forum for advancing the regulation of LAWS.

Spain rejects the use of systems in which the decision to fire does not proceed from a human being and insists on a strictly defensive use of these technologies. The Baltic States, such as Estonia, Latvia and Lithuania, favour the CCW as the legitimate framework for discussions on LAWSs, in line with their industrial interests in robotics.

As for the European Parliament, it calls for a legally binding instrument prohibiting LAWSs without human supervision, and for a strong common position within multilateral forums.

122. Finally, France remains aware of the contribution of artificial intelligence in the field of defence. This is why several

¹⁵⁴ *Ibid.*

¹⁵⁵ *Ibid.*

programmes using AI are currently being developed. This is the case, for example, with the aforementioned programmes, namely SCORPION, SLAM-F and FCAS, which make extensive use of AI to improve tactical situational awareness, protection, data fusion, guidance, obstacle avoidance, sensor/effector management, connectivity and cooperation between manned aircraft and UAVs.¹⁵⁶

B) *Countries' policies on military AI and their compliance with IHL*

1- USA

123. The United States has stated that lethal autonomous weapon systems raise "*important legal, policy and ethical questions*" and has recommended further discussion of this topic in an international humanitarian law forum.¹⁵⁷ Although a policy directive from the Department of Defense authorises the development of such systems, the United States insists that it "*neither encourages nor prohibits the development of such systems in the future*".¹⁵⁸ With regard to compliance with international humanitarian law, the United States believes that IHL provides a robust and consistent regulatory framework for the use of

¹⁵⁶ *Ibid.*

¹⁵⁷ Campaign to Stop Killer Robots, "Report on Outreach on the UN Report on 'Lethal Autonomous Robotics'", 31 July 2013. Available in PDF format at [\[Link\]](#).

¹⁵⁸ Human Rights Watch, "Stop Killer Robots: Country Policies on Banning Fully Autonomous Weapons and Maintaining Human Control". Available at [\[Link\]](#).

weapons.¹⁵⁹ It considers proposals to negotiate a new international treaty on such weapon systems to be “premature”.

124. Furthermore, the US Department of State has published a policy statement on the responsible use of AI and artificial autonomy, which emphasises that the military use of AI, including for autonomous functions and systems, must comply with standing international law and, in situations of armed conflict, be consistent with States’ obligations under international humanitarian law, including its fundamental principles. States should therefore take measures to ensure that their military AI capabilities are used in accordance with international law, in particular IHL, and even seek to use them to improve the implementation of IHL and the protection of civilians. Military AI should also be operated under a chain of command and responsible human control.¹⁶⁰ This statement was signed by France, among others.

125. However, it should be observed that the United States did not sign the “*Declaration on Maintaining Human Control in AI-enabled Weapon Systems*” at the AI Summit held in Paris in 2025. This declaration stipulates, in particular, that the signatory states undertake to use “*AI capabilities in military activities in a responsible*

¹⁵⁹ US Government, Statement to the Group of Governmental Experts on Lethal Autonomous Weapons Systems of the Convention on Conventional Weapons, 10 April 2018. Available in PDF format at [[Link](#)]

¹⁶⁰ U.S. Department of State, “Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy,” 9 November 2023. Available at [[The link](#)] .

*manner, in accordance with international law, in particular international humanitarian law.”*¹⁶¹

2- China

126. The People’s Republic of China takes a cautious but strategic approach to the military applications of artificial intelligence, particularly as regards LAWSs, especially in the context of international humanitarian law. As early as May 2013, at the United Nations Human Rights Council, China expressed its support for the opening of multilateral negotiations on LAWSs, which it described as “excessively complex” in their design and legal framework.¹⁶² It then highlighted the risks that these technologies entail to global strategic stability and arms control management.

127. In December 2016, during discussions held within the framework of the CCW, China reinforced its reservations by stating that LAWSs “*present considerable uncertainties*” as to their compatibility with IHL, and called for the adoption of precautionary measures inspired by the agreed precedent on the ban on blinding laser weapons.¹⁶³ These statements reflect a desire to prevent, rather than react to the potential dangers posed by fully autonomous weapon systems, particularly with regard to compliance with the principles of distinction, proportionality and necessity.

¹⁶¹ Paris Declaration on Maintaining Human Control in AI-Enabled Weapon Systems, *op. cit.*

¹⁶² Human Rights Watch, *op. cit.*

¹⁶³ *Ibid.*

128. In April 2018, China went a step further by calling for a ban on the use of fully autonomous weapons. However, it specified that this ban should not extend to the development or production of such weapons,¹⁶⁴ revealing an ambivalent position, both concerned with preventing their immediate use on the battlefield, but determined not to hinder its own technological capabilities. Since this statement, China has spoken out in favour of negotiating a binding legal instrument on LAWSs, but only within the CCW,¹⁶⁵ demonstrating its continued commitment to multilateral discussion processes.

129. Finally, on 14 December 2021, China published an official document setting out its position on the regulation of military applications of artificial intelligence.¹⁶⁶ This text says that States have a responsibility to promote universal human values and ensure that AI-based weapon systems are designed and used in accordance with the requirements of IHL. It emphasises the need to respect ethical standards in the development, deployment and use of the military technologies concerned. China is thus calling for emerging weapons to comply with fundamental humanitarian principles, to minimise collateral damage, and to prevent the malevolent or uncontrolled use of these systems.¹⁶⁷ This position

¹⁶⁴ *Ibid.*

¹⁶⁵ United Nations, press release, “First Committee: Countries stress importance of considering ethical and humanitarian dimensions of certain conventional weapons.” AG/DSI/3748, 24 October 2024. Available at [[The link](#)].

¹⁶⁶ Ministry of Foreign Affairs of the People’s Republic of China, “Position Paper of the People's Republic of China on Regulating Military Applications of Artificial Intelligence (AI)”, 14 December 2021. Available at: [[Link](#)].

¹⁶⁷ *Ibid.*

reflects a desire for ethical legitimacy on the international stage, while preserving its strategic room for manoeuvre in the field of AI-enabled weaponry.

2- France

130. In 2013, France took the initiative to introduce discussions on LAWSs at the United Nations, within the framework of the Convention on Certain Conventional Weapons, where it played an active role. It is working with its partners to build international consensus and promotes “*the adoption of a set of principles to govern the development and use of future autonomous weapon systems*”,¹⁶⁸ particularly with regard to compliance with IHL. It was in this context of cooperation that France and Germany obtained approval in November 2019 for 11 guiding principles¹⁶⁹ by the CCW state members, which established in particular that IHL “*applies to all weapon systems, including those with autonomy, and that the use of such systems must always be subject to human responsibility*.”¹⁷⁰ These principles also refer to the need for interaction between humans and machines to ensure compliance with IHL. France continues to actively support discussions within the CCW to further develop these principles with a view to incorporating them into a “*normative and operational framework*” applicable to LAWSs.¹⁷¹

¹⁶⁸ Ministry for Europe and Foreign Affairs, “11 principles on lethal autonomous weapons systems,” available at [\[Link\]](#).

¹⁶⁹ *Ibid.*

¹⁷⁰ Ministry for Europe and Foreign Affairs, “11 principles on lethal autonomous weapons systems,” available at [\[Link\]](#).

¹⁷¹ *Ibid.*

131. The French policy on LAWSs is clearly defined and based on several fundamental principles related to compliance with international law, in particular international humanitarian law, and the maintenance of sufficient human control.¹⁷² France considers LAWSs to be weapon systems “*capable of using lethal force without any human intervention or supervision*”,¹⁷³ and capable of reorienting themselves or assigning themselves new missions.¹⁷⁴ Aware of the significant ethical and legal issues raised by the potential development of such weapons, France has “*clearly stated that it will not develop weapon systems capable of using force in a fully autonomous manner, considering that they would be fundamentally contrary to its principles*.”¹⁷⁵ It would not consider it acceptable for decisions on life and death to be entrusted entirely to machines that are not subjected to any form of human supervision. This was reiterated in her speech on 5 April 2019 by Florence Parly, then Minister of Defence, who stated that “*the French position is unambiguous, the French President unambiguously said that France refuses to entrust decisions on life and death to a machine that would act completely autonomously and escape all human control*.”¹⁷⁶

132. From a legal standpoint, France emphasises that for international humanitarian law to apply, the use of a weapon must

¹⁷² French Ministry for Europe and Foreign Affairs, “Lethal Autonomous Weapons Systems: What is the French Position?” Available at [[Link](#)].

¹⁷³ *Ibid.*

¹⁷⁴ *Ibid.*

¹⁷⁵ “Lethal autonomous weapons systems: French initiatives” op. cit.

¹⁷⁶ *Revue Défense Nationale*, 2019/5 No. 820, Foreword – Artificial intelligence and defence, by Florence Parly, pp. 9–17. Available at [[Link](#)].

be linked to human responsibility,¹⁷⁷ and humans must retain the ability to make the final decisions regarding the use of lethal force. Its strategy for developing artificial intelligence for defence is based on three main principles. Compliance with international law, command responsibility for the use of weapons, and the maintenance of sufficient human control, with human-machine interaction allowing for the supervision and control of any weapon system.¹⁷⁸ France will not allow a machine to assign or modify a mission without human validation, and human command remains the sole legitimate authority for defining the rules of use and engagement of weapon systems.

§ 2. *The effects of this arms race*

133. The race for military AI, particularly autonomous systems, whether lethal or non-lethal, could have serious consequences on global security, with risks of uncontrolled escalation and proliferation of lethal autonomous weapon systems (A), as well as ethical and legal risks (B).

A) Consequences on global security

134. In terms of security risks, the race for military AI is likely to involve risks of conflict and strategic instability. Former NATO Secretary General Anders Fogh Rasmussen said that “*the rapid*

¹⁷⁷ “Lethal autonomous weapons systems: French initiatives”, *op. cit.*

¹⁷⁸ French National Assembly, Information Report No. 3248 concluding the work of an information mission on lethal autonomous weapons systems, 22 July 2020, p. 87.

*development and deployment of AI in military systems could fundamentally change the nature of warfare and strategic stability.”*¹⁷⁹

135. **The two main risks.** In an unstable geopolitical climate, this race may cause certain states with strict positions on autonomous weapons to review their stance in order to adapt to the strategies of adversaries who have more flexible positions. We can therefore identify two major risks: uncontrolled escalation and the risk of proliferation of these weapons.

1- Uncontrolled escalation

136. One of the most worrying issues raised by the deployment of lethal autonomous weapon systems is their potential to cause uncontrolled escalation of armed conflicts, at the operational, strategic and geopolitical levels. By profoundly changing the way force is projected, these technologies introduce new imbalances into international relations.

137. Firstly, LAWSs “*increase the risk of conflict escalation as the use of force would be facilitated*,”¹⁸⁰ in particular by making military actions faster, less costly in human lives for the aggressor, and therefore more politically acceptable. This dynamic could lower the

¹⁷⁹ “The future of AI in warfare: key concepts and implications,” available at [\[Link\]](#).

¹⁸⁰ Frédéric Casier, “Urgent call for new international rules on autonomous weapon systems in the face of growing humanitarian risks,” 11/01/2024, available at [\[Link\]](#).

threshold for triggering hostilities,¹⁸¹ particularly in periods of heightened international tension, in which decision-making can be precipitated by the speed of autonomous systems, without sufficient human intervention. In the absence of contextual judgement, mistaken targeting or misinterpretation by the algorithm can lead to unintended escalation or even the outbreak of unwanted conflict.

138. Furthermore, the risk of escalation due to this technological arms race would fuel fears of a “technological surprise” and thus encourage certain states to adopt preventive or pre-emptive postures.¹⁸² This logic may encourage hasty decision-making based on systems that are not yet fully under control, in a context where diplomacy and negotiation have not yet had time to take effect.¹⁸³ The rapid pace of development of military artificial intelligence sometimes outstrips traditional political and legal mechanisms for confidence-building and arms control, which involve, in particular, examining the legality of the weapon.

139. In addition, LAWSs expose the persons affected by conflict, both civilians and non-combatant soldiers, to increased risks of disproportionate use of force. Automated targeting could, in certain situations, result in selecting inappropriate targets due to

¹⁸¹ United Nations General Assembly, Seventy-ninth Session, First Committee, Agenda Item 98 (ss), General and Complete Disarmament: Lethal Autonomous Weapon Systems, A/C.1/79/L.77, 18 October 2024. Available at [\[Link\]](#).

¹⁸² Task Force Report, 2019, p. 7 *op.cit.*

¹⁸³ French National Institute for Strategic and Political Affairs, “Geopolitical implications and international competition: the new race for military AI”, available at [\[Link\]](#).

a lack of contextual information that only human intelligence can assess. Such errors could provoke “retaliation, acts of reprisal”¹⁸⁴ or campaigns of terror, especially if civilians are perceived as the only available targets.

140. These escalation dynamics are not inevitable. Some states, such as France, in their national doctrines, insist on the need to prioritise de-escalation by promoting mechanisms for international cooperation, proportionate responses and rigorous supervision of the use of force.¹⁸⁵ Through this position, France reiterates that strategic stability requires an ethical and responsible approach to the use of new military technologies, in line with international humanitarian law.

141. In the same vein, some authors believe that lethal autonomous weapons, perceived as robots, could, on the contrary, make a process of de-escalation possible.¹⁸⁶ In this sense, states would need to create a feeling of trust around their use in order to calm a climate that could result in uncontrolled escalations. This was already mentioned by the Secretary-General of the United Nations in 1984 as regards nuclear weapons: “the process necessary to initiate de-escalation and reverse the arms race could be facilitated if states took unilateral initiatives aimed at reducing

¹⁸⁴ United Nations General Assembly, Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns, A/HRC/23/47, 9 April 2013, p. 18.

¹⁸⁵ French Ministry of the Armed Forces, *Manual of Military Operations Law*, 2022 edition. Available in PDF format.

¹⁸⁶ Ysens de la Panouse – de France, “The law challenged by the automation of robotic land military systems”, 2019. Available at [[Link](#)].

international tensions by gradually creating a climate of mutual trust and improving the overall atmosphere for negotiations on arms limitation and disarmament.”¹⁸⁷

2- *The risks of proliferation*

142. Another danger related to the AI arms race is linked to the proliferation of artificial intelligence systems. AI is used by everyone because its cost is relatively low compared with other weapons of war such as nuclear weapons. This makes it easy to develop one’s own AI software for integration into autonomous weapons systems.

Consequently, AI integrated into autonomous weapon systems, whether lethal or non-lethal, “*could fall into the hands of non-state actors, such as terrorist groups, seeking to exploit the weaknesses of established powers.*”¹⁸⁸

This proliferation of AI-enabled autonomous weapons therefore poses a major security challenge that makes regulation complex. Indeed, even though advanced countries are discussing how to regulate them, certain terrorist groups, non-state actors or simply hackers could cause even more humanitarian damage.

¹⁸⁷ A/39/516, Review of the implementation of the recommendations and decisions adopted by the General Assembly at its^{10th} special session – Unilateral nuclear disarmament measures, Report of the Secretary-General, 5 October 1984, §2. Cited by Grégory Bouterin, «Maîtrise des armements non conventionnels: le salut viendra-t-il du soft disarmament?» (*Control of unconventional weapons: will salvation come from soft disarmament?*), AFDI, LIII, 2007, p. 243. Available in PDF format at [[The link](#)].

¹⁸⁸ French National Institute for Strategic and Political Affairs, “Geopolitical implications and international competition: the new race for military AI”, available at [[The link](#)].

On the complexity of regulating military AI systems due to their proliferation, Laure de Roucy, director of the Geopolitical Technology Centre at the French Institute of International Relations, makes a useful comparison on the issue. She notes that “in the years just before the Ottawa Convention, it was estimated that 110 million anti-personnel mines were deployed in 64 countries, each costing \$3 – making them accessible to any country,” but ultimately “even with widely available and inexpensive weapons, regulation proved possible.”¹⁸⁹ This example shows that regulation of the proliferation of military AI is a complex challenge, but not an insurmountable one.

B) Ethical and legal challenges

143. The race for military AI also poses many challenges. Although discussions on the regulation of LAWSs have been ongoing since 2013 at the CCW, the fact remains that the decision to kill made by a machine raises ethical and legal questions.

1- Ethical issues

144. Origin of ethics. The term *ethics* derives from the Greek *êthos*, and the word *moral* from the Latin *mos-moris*, both referring to customs, conduct or rules of life. Etymologically, they share a similar meaning. However, in contemporary thinking, a distinction has gradually emerged. Morality is often perceived as a set of universal, rigid and prescriptive rules, while ethics, which is more contextual, refers to a reflection on *good behaviour*, rooted in

¹⁸⁹ Laure de Roucy-Rochegonde, *War in the age of artificial intelligence: when machines take up arms*, PUF edition, 1st edition, 2024 edition, p. 306.

concrete situations.¹⁹⁰ According to Paul Ricœur, it represents “*the very movement of freedom that seeks a good life, in concern for others and in a proper use of social institutions.*”¹⁹¹

145. Military ethics. In the military field, this ethical approach is essential when it comes to the use of lethal autonomous weapons systems. Their decision-making autonomy raises profound questions about the delegation of lethal force to a machine. France’s position on this point is clear: “from an ethical point of view, it is not acceptable for decisions of life and death to be entrusted entirely to machines that are beyond any form of human supervision.”¹⁹²

146. The example of Soviet Colonel Stanislav Petrov, which we mentioned earlier (No. 83), powerfully illustrates the need for human discernment in high-intensity contexts. While human error remains possible, it is accompanied by moral judgement, an ability to contextualise, to doubt, and sometimes to disobey, in the name of a higher good. No machine, however sophisticated, can yet reproduce this ethical faculty.

147. Nevertheless, some experts argue that it would be possible, in certain cases, to design robots capable of complying with international humanitarian law standards. Robotics specialist

¹⁹⁰ Laure Tabouy, Transhumanism Course, M2 Artificial Intelligence Law.

¹⁹¹ Paul Ricoeur, *Oneself as Another*, Éditions du Seuil, 1990, p. 202. Available in PDF format at [\[link\]](#)

¹⁹² French Ministry for Europe and Foreign Affairs, “Autonomous Lethal Weapons Systems: French initiatives,” *op. cit.*

Ronald Arkin has proposed the integration of an ethical control device, known as the “*Arkin Test*”, into autonomous systems to ensure their compliance with IHL principles during military operations.¹⁹³

148. A structured reflection on ethics within the armed forces is therefore necessary to balance technology and societal values and appears to be the “*only pragmatic solution to regulate the rise of LAWSs, as opposed to a general ban, which would be ineffective and even counterproductive.*”¹⁹⁴

2- Legal challenges

149. The introduction of artificial intelligence into lethal autonomous weapons systems raises profound questions about their compliance with international humanitarian law, particularly with regard to compliance with the fundamental principles of distinction, proportionality and precaution. A key initial question is whether machines, even sophisticated ones, can truly guarantee compliance with these standards, which involve complex contextual and ethical judgements.

¹⁹³ Ronald Arkin, *Governing Lethal Behaviour in Autonomous Robots* (CRC Press, 2009); Kenneth Anderson and Matthew Waxman, “Law and ethics for robot soldiers,” *Policy Review*, no. 176 (2012). Cited by Christof Heyns, Special Rapporteur on extrajudicial, summary or arbitrary executions. United Nations General Assembly, A/HRC/23/47, 9 April 2013.

¹⁹⁴ Nathalie Durhin, “Lethal autonomous weapons systems: don't mix law and ethics,” *Revue Défense Nationale*, 2018/HS1 Special Issue, pp. 167-176. Available at [\[Link\]](#).

150. Some analysts argue that, because of their ability to operate without human emotions, LAWSs could theoretically better apply the rules of IHL, in particular by discriminating more precisely between combatants and non-combatants, or by calibrating the force used according to the threat. Thus, the report of the French Ministry of the Armed Forces' *AI and Defence Task Force* emphasises that artificial intelligence could “*promote compliance with international humanitarian law by enabling a better assessment of the operational environment at the tactical, operational and strategic levels,*”¹⁹⁵ while reinforcing the proportionality and strict necessity of military actions.

151. However, these possibilities are hampered by major technical limitations. A key issue lies in the very design of these systems, which is largely dependent on human bias. Indeed, as several reports have pointed out, LAWSs could prove to be discriminatory for a variety of reasons. The cognitive biases of developers, their programming choices, and even the data used to train the algorithms can profoundly influence the decision-making behaviour of the systems. This algorithmic bias, which is sometimes invisible, directly calls into question the ability of LAWSs to apply the principles of distinction or proportionality in a neutral manner, particularly in complex and dynamic operational contexts.¹⁹⁶ The French National Assembly's information report thus points out that the perception capabilities of LAWSs, based

¹⁹⁵ Task Force Report, 2019, *op. cit.*

¹⁹⁶ Human Rights Watch, “A danger to human rights, autonomous weapon systems and digital decision-making processes,” summary and recommendations, 28 April 2025. Available in PDF format at [[Link](#)].

solely on pre-established algorithms, are likely to be unsuited to the complexity of the battlefield. It is pointed out that “*the ability of a LAWS to distinguish between a civilian and a combatant directly calls into question its ability to comply with the principle of distinction*”,¹⁹⁷ and that the algorithmic modelling of the principles of proportionality or prohibition of unnecessary suffering remains extremely delicate, as it requires subtle contextual judgement.

152. The Council of Europe, in its 2022 resolution draft, emphasises the importance of the predictability of LAWSs in order to ensure their compliance with the precautionary principle. According to the Council, “*to comply with the precautionary principle, the action of LAWSs must be predictable. Users must be able to adjust or cancel the effects of weapon systems if necessary, which is only possible if they can reasonably predict the future action and reaction of a weapon system.*”¹⁹⁸ On the predictability of systems, the ICRC has taken the position that “*unpredictable autonomous weapon systems should be formally excluded, in particular because of their indiscriminate effects.*”¹⁹⁹

153. With this in mind, human control remains crucial, both in the programming phase and at the moment of lethal action. In this regard, Professor Marie-des-Neiges Ruffo suggests that “*humans*

¹⁹⁷ French National Assembly, Information Report No. 3248, *op. cit.*

¹⁹⁸ Council of Europe, Committee on Legal Affairs and Human Rights, “The emergence of lethal autonomous weapon systems (LAWS) and their necessary regulation by European human rights law”, resolution draft adopted unanimously by the Committee on 14 November 2022. Available in PDF format at [\[Link\]](#).

¹⁹⁹ *International Review of the Red Cross*, “Position of the International Committee of the Red Cross on autonomous weapon systems and reference documentation”, IRCC No. 915, January 2022. Available at [\[Link\]](#).

*remain the experts who will verify the ‘sorting’ criteria and make the final distinction to spare the innocents”, emphasising the need for human intervention both a priori, through the definition of targets, and a posteriori, in the execution of the attack. She also recommends that, in order to comply with the principle of distinction between combatants and non-combatants, an area should be clearly identified and delineated “to warn civilians not to approach”.*²⁰⁰

154. On the issue of responsibility, the ICRC maintains the position according to which those who “*plan, approve and carry out military operations*”²⁰¹ are responsible for the legal obligations and principles set out in IHL. However, “*the increase in the speed of targeting, the scale of force that can be used, and the reliance on artificial intelligence and machine learning for targeting and force control reduces the ability of human users to interpret the information they receive, critically analyse their choices, and act quickly in accordance with humanitarian, legal, and ethical principles.*”²⁰² This statement highlights one of the most sensitive legal challenges associated with the increasing automation of lethal decisions: the dilution of responsibility, which we will address later in this discussion. Although “*States agree on the*

²⁰⁰ MdN Ruffo, “Do we have a choice about using AI in wartime?”, 47th issue of *Cahiers de la sécurité et de la justice*, 12 March 2020, *op.cit.*

²⁰¹ ICRC, Report, “International humanitarian law and the challenges posed by contemporary armed conflicts: a renewed commitment to protection in armed conflicts on the occasion of the 70th anniversary of the Geneva Conventions,” 2020. Available in PDF format.

²⁰² ICRC Review, “Position of the International Committee of the Red Cross on autonomous weapon systems and reference documents,” *op. cit.*

*importance of human control, or ‘human responsibility’, to ensure compliance with the law, opinions differ on what this means in practice.’*²⁰³

155. Conclusion of Part 1. Ultimately, the question of the compliance with IHL of AI-enabled human targeting weapon systems, whether autonomous or not, remains unresolved. Indeed, military AI systems pose numerous legal, technical and ethical challenges that hinder their compliance with IHL principles. However, such compliance is not impossible if States work together to adapt IHL to the era of military AI.

²⁰³ ICRC, Report, “International humanitarian law and the challenges posed by contemporary armed conflicts: renewed commitment to protection in armed conflicts on the occasion of the 70th anniversary of the Geneva Conventions”, 2020, *op.cit.*

PART 2: Towards an adaptation of IHL to the era of military AI

156. In light of the technological changes brought about by military AI, a key question arises: can these systems be effectively adapted to existing international humanitarian law standards, or do the technical limitations of AI require changes in the legal framework? This section first explores the issues related to the legal responsibility arising from the use of these technologies (Chapter 1), before examining the need for a renewed legal and ethical framework to regulate their deployment (Chapter 2).

Chapter 1: The challenges of responsibility

157. The use of autonomous weapon systems raises important liability issues. These issues are linked to legal and operational reasons (Section 1), but also to the means of regulating them (Section 2).

Section 1: The reasons for this responsibility resulting from the use of this type of AI systems

158. The causes of liability related to LAWSs are linked in particular to a twofold erosion. On the one hand, there is the erosion of effective human control (§1), whether these systems are under human supervision or outside of any control, and on the other hand the erosion of direct human responsibility (§2), in particular through the disappearance of human agency in favour of machine agency.

§ 1: Erosion of human control

A) The case of human-targeted AI systems under human supervision (such as Lavender)

159. In debates on the use of AI by the military, the aspect of *meaningful* human control is often mentioned. This concept refers to the ability of a human operator to understand the decisions made by the system, intervene to modify, stop or validate an action,

and take responsibility for it.²⁰⁴ It is this control that is supposed to be exercised in human targeting AI systems under human supervision, such as the *Lavender* system used by the Israeli army.

1- *Lavender vs LAWS*

160. Presentation of Lavender and other uses of AI by the Israeli army. The role of artificial intelligence in contemporary conflicts has become a crucial topic of debate. The Israeli army, a pioneer in the implementation of these technologies, uses various AI applications to support its military strategies. Among these technologies, the Lavender system has been particularly prominent in optimising human targeting. This system is designed to identify individuals based on specific criteria, such as their alleged affiliation with Palestinian armed groups, by assigning scores to Gaza residents.²⁰⁵ These scores then determine the list of people potentially targeted for air strikes. According to an investigation by *+972 magazine*, Lavender's influence “*was such that the AI's results were treated as if they were human decisions*”,²⁰⁶ with little questioning of the machine by operators. Complementing this system, tools such as ‘*Where's Daddy?*’ precisely locate these targets before they are eliminated by Israeli forces. However, although Lavender's technology does not directly make the decision to carry out a lethal strike, it plays a decisive role in preparing these attacks by submitting a list of targets that humans simply validate.

²⁰⁴ ICRC, “Expert meeting on lethal autonomous weapons systems”, 2017/11/15. Available at [\[Link\]](#).

²⁰⁵ Human Rights Watch, “Gaza: Israeli military's digital tools endanger civilians,” 10 September 2024. Available at [\[Link\]](#).

²⁰⁶ Yuval Abraham, “Lavender: The AI machine directing Israel's bombing spree in Gaza”, *+972 Magazine*, 3 April 2024. Available at [\[Link\]](#).

This dynamic raises an important question: to what extent do humans retain effective control over these AI systems, especially when the machine becomes the main decision-maker?

161. Distinction between this type of system and LAWSs.

It is essential to distinguish between systems such as Lavender and lethal autonomous weapon systems, which make decisions entirely on an autonomous basis, without direct human intervention. While Lavender supports human decision-making, its role is limited to the targeting phase, with the military remaining responsible for whether or not to activate the strike. In contrast, LAWSs, as their name suggests, allow AI to make the decision to kill without human supervision, analysing situations autonomously and engaging in attack without the final approval of an operator. In its reports, the ICRC warns against the development of such technologies, stressing that the absence of human decision-making compromises accountability and could undermine the fundamental principles of international humanitarian law.²⁰⁷ Thus, the line between AI assistance to human operations and complete automation of action is thin but fundamental. The distinction between Lavender and LAWSs therefore rests on the question of human control.

2- Factors contributing to the erosion of human control

162. Erosion of human control due to the acceleration of the pace of war. In 2020, the ICRC was already warning against the use of AI in decision support systems, which “could have

²⁰⁷ A warning that can be found in most ICRC reports on autonomous weapons and the use of artificial intelligence.

profound consequences on the role of human beings in armed conflicts.”²⁰⁸ As such, the Committee recommended a human-centred approach with human judgement prevailing in all decisions likely to have “serious consequences for people’s lives”²⁰⁹ and likely to violate IHL. However, in an operational context, the reality is quite different and undermines this recommendation.

163. One of the major challenges lies in the acceleration of the pace of operations, where decisions must be made in increasingly shorter time frames. In this context, the role of the human operator is becoming increasingly reduced. In this regard, the Israeli army's use of Lavender is a striking example. According to an investigation conducted by Yuval Abraham, an Israeli army officer revealed that he spent barely 20 seconds examining each target before validating the machine’s decision.²¹⁰ This short validation period calls into question the notion of effective human control advocated by the ICRC. Swiftness of decisions, imposed by the urgency of the conflict, prevents genuine reflection on the proportionality and distinction of targets. Humans, thus reduced to an administrative formality, find themselves in a situation where their ability to intervene in a meaningful way is diluted. Indeed, the ICRC stresses that “*the increase in targeting speed, scale of the force that can be used, and dependence on artificial intelligence and machine learning for*

²⁰⁸ ICRC, Report, “International humanitarian law and the challenges posed by contemporary armed conflicts: a renewed commitment to protection in armed conflicts on the occasion of the 70th anniversary of the Geneva Conventions”, 2020, *op. cit.*

²⁰⁹ *Ibid.*

²¹⁰ Yuval Abraham, “Lavender: The AI machine directing Israel’s bombing spree in Gaza”, +972 Magazine, *op. cit.*

*targeting control and the use of force – reduce the ability of human users to interpret the information they receive, to critically analyse their choices, and to act quickly in accordance with humanitarian, legal, and ethical principles.”*²¹¹

This acceleration of the decision-making process by machines creates pressure that undermines compliance with the principles of precaution and proportionality, two fundamental values of international humanitarian law.

While AI offers speed gains in the military decision-making cycle, this advantage can increase the risks to civilians. Conversely, slowing down the process through “strategic patience” allows for better evaluation of options, but the idea that AI would facilitate this patience by accelerating the preliminary phases remains a simplistic view of targeting.²¹² This leads us to examine the dangers of overconfidence bias, which is amplified by dependence on these AI systems.

164. Erosion of human control due to overconfidence bias.

Overconfidence bias is another worrying consequence of using AI in military decision-making. In an environment where machines provide results that are supposed to be reliable and objective based on complex algorithms, human operators are likely to become overly dependent on these tools and place blind trust in them. The use of Lavender, despite its margins of error, illustrates this phenomenon well. According to the investigation, Lavender

²¹¹ *International Review of the Red Cross*, “Position of the International Committee of the Red Cross on autonomous weapon systems and reference documentation”, *op. cit.*

²¹² Stewart, Ruben and Hinds, Georgia, “The algorithms of war: the use of artificial intelligence for decision-making in armed conflicts”, 22 February 2024, available at [\[Link\]](#).

identified up to 37,000 Palestinians as potential targets, with a margin of error of 10%,²¹³ meaning that up to 3,700 civilians could be wrongly included in this list. Yet in this type of situation, humans validate these decisions without questioning the AI's results, convinced that the machine, due to its apparent objectivity, cannot be wrong. Overconfidence bias results in a dilution of human control, especially since humans now only have a validation role rather than a critical decision-making role.

165. Human-machine interaction poses challenges related to human cognitive limitations, notably “automation bias”. This refers to the human tendency not to critically examine diagnoses generated by the system or to seek out contrary information, especially in emergency situations.²¹⁴ In armed conflicts, excessive trust can have fatal consequences. In this regard, the 2003 incident involving the US Patriot system, which fired on allied aircraft because they were mistakenly identified as enemies, showed that operators' trust in the software was a major shortcoming.²¹⁵ In this context, these modes of operation and human-machine interaction can increase the likelihood that AI assessments will deviate from the actual intentions of human decision-makers, which may result in a risk of unintended escalation and increased danger to civilians.²¹⁶

²¹³ Yuval Abraham, “Lavender: The AI machine directing Israel’s bombing spree in Gaza”, +972 *Magazine*, *op. cit.*

²¹⁴ *Ibid.*

²¹⁵ *Ibid.*

²¹⁶ *Ibid.*

166. This phenomenon raises significant concerns regarding compliance with international humanitarian law, particularly with regard to the distinction between civilians and combatants, as well as the proportionality of attacks.

3- Tension with IHL

167. The use of AI systems in military conflicts, although intended to make operations more effective, raises serious questions about compliance with the principles of international humanitarian law.

Actually, the principle of distinction, which requires distinguishing civilians from combatants and targeting only the latter, is compromised when systems such as Lavender identify individuals based on algorithms that may be biased or erroneous. Furthermore, the principle of proportionality, which requires that attacks do not cause excessive harm to civilians in proportion to the expected military advantage, is also jeopardised. Strikes based on incomplete or distorted data can result in disproportionate civilian casualties. The heavy civilian toll can be explained by human decisions in line with Israeli targeting doctrine.²¹⁷ After 7 October 2023, the “kill list” was significantly expanded, weakening the principle of proportionality. In some cases, the Israeli army accepted the deaths of dozens or even hundreds of civilians in order to target a single member of Hamas.²¹⁸

²¹⁷ Laure de Roucy-Rochegonde and Amélie Férey, “Israeli bombing in Gaza: how artificial intelligence is destroying ethical safeguards,” 7 May 2024. Available at [\[Link\]](#).

²¹⁸ *Ibid.*

Finally, the precautionary principle, which requires measures to be taken to minimise risks to civilians, is also undermined by the speed of decisions and the inability to reassess each situation in real time. In line with the ICRC tenets, the absence of human judgement in decision-making could result in a violation of the principles of precaution, proportionality and distinction. These concerns are all the more important in the face of technologies such as Lavender, where humans are reduced to a rapid validation function, with no real possibility of intervention.

168. This case really shows that human control is being diluted in favour of machine control. Ultimately, it is humans who are becoming machines, agreeing with the decisions made by the latter and automatically killing the targets detected by the system without taking a step back. Whereas decision-making support systems should be “*useful in informing human decision-making, but cannot replace it in situations that endanger the lives and dignity of people in armed conflict.*”²¹⁹

This therefore poses a real problem in terms of compliance with IHL, particularly with regard to the principles of distinction, proportionality and precaution.

While human control is supposed to ensure that these principles are respected, we can clearly see that this is not entirely the case with the use of Lavender.

²¹⁹ Stewart, Ruben and Hinds, Georgia, *op. cit.*

B) *The case of fully autonomous human targeting AISs*

169. We have seen that in the case of *Lavender*, human control is becoming increasingly weak, while the machine is becoming increasingly autonomous. This is how the shift is taking place towards fully automated weapons designed to kill, known as LAWSs.

1- *The complete disappearance of the human element from the loop...*

170. The current trend in the development of autonomous weapon systems suggests a gradual and then total disappearance of human presence in the decision-making loop. While systems such as *Lavender* already show a significant weakening of human control in favour of automation, other so-called “Terminator” models²²⁰ go much further. These systems completely exclude humans from the decision-making loop and, according to Thierry Berthier’s classification of levels of automation in weapon systems, they would correspond to Level L5, that is, an “*autonomous weapon system without human supervision, in which the human operator does not have the ability to regain control of the fully autonomous system.*”²²¹ The entire process, from the detection of objects, shapes, and targets to the opening of fire, is carried out by the system itself.²²² Thus, the system as a whole, whether in the form of a robot or a swarm of drones, would be tasked with operating in full autonomy. Artificial

²²⁰ NOËL, Jean-Christophe, “Does AI have a future in the armed forces?”, article published in *Revue Défense Nationale*, 2019/No. 820. Available at [Link].

²²¹ Thierry Berthier, «Systèmes armés semi-autonomes: que peut apporter l'autonomie?», *Revue Défense Nationale*, 2019/5, n°820, pp. 74- 80. Disponible sur [Le lien].

²²² *Ibid.*

intelligence ensures both the planning and execution of the mission, prioritizing certain courses of action “*depending on the context or the known tactical situation*,”²²³ based on the analysis of “*virtual combat scenarios it has tested against itself, in a manner similar to AlphaGo Zero*.”²²⁴

In this configuration, humans no longer participate in target selection or strike coordination. At most, they can authorise the system to be activated in advance, within a framework that may or may not be defined.

171. Although this model still seems hypothetical from technical, ethical and moral points of view, it is nevertheless being considered in systems that are already operational. For example, the American Aegis system incorporates “*fully automated firing modes*,”²²⁵ raising the crucial question of replacing human decision-making in armed conflicts. This technological shift is fuelling an increasingly urgent legal and ethical debate around the concept of “meaningful human control”. International discussions on “sufficient” or “meaningful” human control over LAWSs are a clear reflection of this growing concern. The fact that this debate exists is evidence that a technological and doctrinal shift is already underway. This observation lays the foundations for a profound doctrinal transformation, in which humans become nonessential in a combat system dominated by algorithmic logic.

²²³ Noël, Jean-Christophe, «*L'IA a-t-elle un avenir pour les armées?*», *op.cit.*

²²⁴ *Ibid.*

2- ...with the advent of AI hyperwarfare

172. This process of total weapon system autonomy logically leads to what some authors call hyperwarfare, *i.e.* a form of conflict that is almost entirely beyond human intervention. According to General John Allen and A. Husain,²²⁶ “*in military terms, hyperwarfare can be redefined as a type of conflict where human decision-making is almost entirely absent from the observation-orientation-decision-action loop.*”²²⁷ In this model, “*complex and largely autonomous swarm systems conduct coordinated kinetic strikes, imposing quasi-instantaneous automated responses.*”²²⁸ The speed of execution of actions on the battlefield becomes such that humans are cognitively overwhelmed, to the point that “*AI alone could command the response*”,²²⁹ driven by “*ever faster software.*”²³⁰

173. Hyperwarfare is based on a swarm doctrine,²³¹ where AI overcomes human cognitive limitations in terms of coordination. Ultimately, “*AI could enable swarming to become the dominant mode of operation, with thousands of units scattered across a battlefield and then converging to attack.*” Such an approach would render traditional hierarchical structures obsolete, and human intervention would be reduced to defining general objectives. Tactical action would be

²²⁶ *Ibid.*

²²⁷ General John R. Allen and Amir Husain, “On hyperwar”, U.S. Naval Institute, July 2017. Available at [\[Link\]](#).

²²⁸ Thomas Noizet, “Drone swarms: holy grail or pipe dream?”, *Revue Défense Nationale* 2023/HS13 Special Issue, pp. 239-256. Available at [\[Link\]](#).

²²⁹ Noël, Jean-Christophe. *op. cit.*

²³⁰ *Ibid.*

²³¹ Paul Scharre, *Four Battlegrounds: Power in the Age of Artificial Intelligence*, published by W.W Norton & Company. Excerpt available at [\[Link\]](#).

entrusted to the machine, in a model no longer based on collaboration but on remote supervision, where “*humans would define objectives and supervise, but entrust the execution of swarm behaviour to AI systems.*”²³²

174. This paradigm shift is reminiscent of historical precedents. The integration of AI into warfare could thus repeat the mistakes of the First World War, when the military struggled to adapt their tactics to the increased lethality introduced by the machine gun. This comparison highlights the risk of doctrinal inadequacy in case of radical technical transformation. In the long term, a *military*-²³³ *singularity* could arise, where conflicts, accelerated beyond human supervisory capabilities, would be decided and conducted entirely by artificial intelligence. Such a development could mark the end of human control over warfare, not by accident, but due to an inability to keep pace with it.

175. Such a development, although a long way off, would involve a gradual abandonment of human strategic, tactical and operational control over armed conflicts, with potentially irreversible consequences, *i.e.* even if humans chose to start a conflict, they could lose “*the ability to control the escalation or end it at any time.*”²³⁴ Thus, as Jacques Ellul mentioned, “*it is now technology*

²³² Paul Scharre, *op. cit.*

²³³ *Ibid.*

²³⁴ *Ibid.*

*that makes the choice [...]. Man is definitely no longer the instrument of choice.”*²³⁵

176. Thus, whether in the case of human-supervised AISs or fully autonomous AISs, the erosion of human control is increasingly evident, and this “*lack of human control would therefore result in a dilution of responsibility, making it virtually impossible to judge and redress violations of IHL.*”²³⁶

§ 2: Erosion of human responsibility

177. The word *responsibility* is derived from the Latin *respondere*, which means “to answer for”.²³⁷ It refers to an obligation to account for one’s actions, an essential foundation of any legal system. In criminal law, this means that the individual who has committed a reprehensible act must be identified, tried and, if necessary, punished. However, advances in artificial intelligence have led to its integration into lethal autonomous weapons systems, capable of deciding on their own to open fire, thus disrupting traditional categories of law. These technologies raise a major question: who is responsible when a machine kills?

²³⁵ Jacques Ellul, *La technique ou l'enjeu du siècle* (Technology or the challenge of the century), 1954, Ed Economica, 1990, coll. classiques des sciences sociales (social science classics) edited by Hervé Coutau-Bégarie. p.74, II. Characteristics of modern technology, Automatism of technical choice.

²³⁶ Laure de Roucy-Rochegonde, *War in the Age of Artificial Intelligence: When Machines Take Over the Armed Forces*, Edition Puf, 2024, p.142.

²³⁷ La toupie, dictionary of politics, “responsibility”, available at [\[Link\]](#)

A) Actus reus and mens rea: the foundations of criminal responsibility

178. Criminal liability is traditionally based on two pillars: *actus reus*, the illegal act itself, and *mens rea*, criminal intent.²³⁸ Both elements are essential for an individual to be held liable. Simply causing harm is not enough; the act must also have been committed with awareness, intent or negligence.

International criminal courts have clarified these conditions. For example, in the Kavishema and Ruzindana case of 21 May 1999, the International Criminal Tribunal for former Yugoslavia stated that “*there is a further two-stage test which must be satisfied in order to establish individual criminal responsibility [...]. This test required the demonstration of (i) participation, that is that the accused's conduct contributed to the commission of an illegal act, and (ii) knowledge or intent, that is awareness by the actor of his participation in a crime.*”²³⁹ Thus, individual criminal responsibility requires both the effective participation of the accused in the act under investigation and the awareness that he was participating in a crime. Without both of these criteria being met, no conviction is possible.

This framework is difficult to apply to LAWSs. Can a machine have intent? Can it discriminate? LAWSs, devoid of consciousness, emotions or morality, do not meet these criteria. They cannot therefore be judged according to the fundamental principles of criminal law.

²³⁸ Laure de Roucy-Rochegonde, *op. cit.*, p. 138.

²³⁹ ICTY, Trial Chamber II, The Prosecutor *v.* Clément Kayishema and Obed Ruzindana, 21 May 1999, §198. Available at [Link].

B) *The disappearance of human agency: a paradigm shift*

1- *From human agency...*

179. The concept of agency refers to an individual's ability to act intentionally, based on rational choices oriented towards goals. In English, this concept is summarised by the term *agency*, which refers to an autonomous actor capable of influencing things and beings. According to the Stanford Encyclopaedia of Philosophy, “*an agent is a being with the capacity to act, and 'agency' refers to the exercise or manifestation of that capacity.*”²⁴⁰ .

180. In the context of international humanitarian law, it is precisely this human agency that structures the set of rules, notably the distinction between civilians and combatants, the principle of proportionality, and the principle of precaution. Everything rests on the ability of a soldier or a commander to assess the situation and make moral and legal decisions.

2- *...to the agency of the machine*

181. The emergence of LAWSs shifts this agency towards the machine. It is no longer humans who decide, but an algorithmic system that performs a mission in a completely autonomous manner. As a result, humans are completely absent from the decision to use force at the crucial moment..

182. IHL, designed for a world of ‘human’ warfare, does not take this shift into account. Indeed, as Nathalie Nevejans points out, “*How can a machine apply rules designed for humans?*”²⁴¹ This makes

²⁴⁰ Stanford Encyclopaedia of Philosophy, *Agency*, first published Mon 10 Aug 2015; substantive revision Mon 28 Oct 2019. Available at [\[link\]](#).

²⁴¹ Nathalie Nevejans, *The legality of war robots in international conflicts*, *op.cit.*

the application of the law problematic, as LAWSs do not perceive intent, do not assess emotions, and have no moral sense. This dehumanisation of conflicts makes it difficult to comply with the rules of war and illustrates the current limitations of IHL.

C) The problem of attributing responsibility to LAWSs

183. When human agency disappears, a legal grey area is created. Who is responsible when a LAWS commits a violation of IHL? Indeed, “*from a legal point of view, for international humanitarian law, which governs armed conflicts, to apply, the use of a weapon must be linked to human responsibility*”.²⁴² But as we have seen, a fully autonomous weapon system, which makes the decision to kill on its own, raises questions about the potential human responsibility behind this act. However, the Rome Statute is clear: without a clearly identified human perpetrator, no fair trial is possible.²⁴³

184. Several hypotheses have therefore been put forward, notably in the search for responsibility from the design of LAWSs to the individual who activated them. But this chain of responsibility is fragmented and diluted. Julien Ancelin even refers to “elusive” responsibility between political and military decision-makers, industrialists, programmers and operators.²⁴⁴

²⁴² French Ministry for Europe and Foreign Affairs, “Lethal Autonomous Weapons Systems: French initiatives”, February 2020. Available at: [\[Link\]](#)

²⁴³ Dominique Lambert, p.84, *op.cit*

²⁴⁴ Julien Ancelin, “Lethal Autonomous Weapons Systems (LAWSs): Legal Issues Arising from the Emergence of a Dehumanised Means of Combat,” *La Revue des droits de l’homme, Actualités Droits-Libertés*, published online on 25 October 2016, accessed on 20 November 2024. Available at [\[Link\]](#).

Ronald Arkin, for his part, suggests imposing technical monitoring to identify the human agent responsible for activating the machine.²⁴⁵

185. Finally, this dilution of responsibility has moral consequences: in the absence of a human culprit, there can be no acknowledgement of guilt, no request for forgiveness and no reconciliation. This makes any meaningful post-conflict justice process impossible in the *jus post bellum*.²⁴⁶

186. LAWSs disrupt the foundations of criminal responsibility and international humanitarian law. By replacing humans in the decision-making loop, they render the traditional foundations of *actus reus*, *mens rea* and human agency ineffective. The law is now overtaken by technology, unable to designate a clear responsible party when the perpetrator is a machine. Faced with this development, it is essential to reconsider legal and ethical frameworks in order to guarantee inalienable human responsibility in the use of force. For without responsibility, and “*without humans to fight, there will be no humans to make peace.*”²⁴⁷

Section 2: The means to curb this responsibility

187. Faced with the challenges posed by the responsibility of human targeting AI-enabled systems, several avenues can be

²⁴⁵ Mdn Ruffo, *op.cit.*

²⁴⁶ Mdn Ruffo, *op.cit.*

²⁴⁷ *Ibid.*

explored, including the attribution of legal personhood to robots (§1) or the use of alternative accountability mechanisms (§2).

§ 1: Granting legal personhood to lethal autonomous robots: an illusory solution?

188. Some schools of thought have considered recognising legal personhood concerning the most advanced autonomous Artificial Intelligence Systems.²⁴⁸ The idea is that, like legal persons such as companies or associations, these entities could be assigned their own obligations and responsibilities. In a military context, this could make it possible to hold the LAWSs themselves directly responsible for damages. Indeed, it seems problematic “*to confer authority on beings that are otherwise endowed with increasing autonomy, and therefore capable of making decisions on their own, without entrusting them with any responsibility in return.*”²⁴⁹

A) Decision-making autonomy of military AIs?

1- Doctrinal positions

189. On a doctrinal level, while lawyer Alain Bensoussan argues for the creation of a legal personhood for robots²⁵⁰ due to their autonomy and freedom of decision, this position remains isolated among doctrine researchers. Lawrence Solum, in his article entitled

²⁴⁸ Alain Bensoussan in his 2013 Charter of Robot Rights and the European Parliament's 2017 motion for a resolution on civil law rules on robotics.

²⁴⁹ Paul Ismard, *La cité et ses esclaves* (The city and its slaves), Institutions, fictions, expériences, Seuil, 2019, pp. 55-74. Incise I, “Is a robot a slave like any other?”

²⁵⁰ A. Bensoussan, «Les robots ont-ils une personnalité?», *Planète Robots* no. 19, Jan. 2013, available at: [\[Link\]](#)

“Legal Personhood for Artificial Intelligences,”²⁵¹ already raised the question of the legal personhood of AI, but pointed to the lack of intentionality as a major difference from human intelligence, which is problematic particularly from the perspective of assigning responsibility. Although the law can sometimes do without intentionality, the absence of free will in a robot, which follows its programming, is a fundamental obstacle to its assimilation to a human person endowed with free will.

2- European Parliament’s proposal

190. Furthermore, the European Parliament, which took up the issue in 2017, proposed creating “*a specific legal personhood for robots, so that at least the most sophisticated autonomous robots can be considered responsible electronic persons, liable for any damage caused to a third party; it would be conceivable to confer electronic personhood on any robot that makes autonomous decisions or interacts independently with third parties.*”²⁵² This proposal shows a rapid shift from the idea of functional recognition to the goal of making robots financially liable in the event of damage. However, an open letter to the European Commission raised concerns about the criteria, social utility and symbolic implications of such recognition and insisted that “*from an ethical and legal point of view, the creation of legal personhood for a robot is inappropriate regardless of the model of legal status.*”²⁵³ Similarly,

²⁵¹ Lawrence B. Solum, “Legal Personhood for Artificial Intelligences”, 70 *N.C.L. Rev.*1231 (1992), available at: [\[Link\]](#). Paragraph c

²⁵² European Parliament resolution of 16 February 2017 containing recommendations to the Commission on civil law rules on robotics (2015/2103(INL))

²⁵³ Open letter to the European Commission, Artificial Intelligence and Robotics. Available at [\[Link\]](#).

UNESCO's World Commission on the Ethics of Scientific Knowledge and Technology stated that "*it would be absurd to call them 'persons' since they lack certain other qualities generally associated with human beings, such as free will, intentionality, self-awareness, moral sense and sense of personal identity.*"²⁵⁴ .

Ultimately, the European Economic and Social Committee issued an unfavourable opinion,²⁵⁵ and the project was abandoned. The proposed European directive of 28 September 2022 focusing on liability for AI was also abandoned on 11 January 2025, demonstrating the difficulty of attributing liability to a machine.

B) Heritage for autonomous military robots

191. The question of the assets of robots, which are necessary to assume potential financial liability, also raises difficulties. While lawyer Bensoussan proposes capital based on the risks incurred, behind any legal entity, whether moral or envisaged for robots, lies the question of contributions and guarantees, often provided by natural persons.²⁵⁶ Indeed, human beings remain well behind the supposed personhood of the robot, in that lawyer Bensoussan provides in Article 2 of his Charter of Robot Rights that robots

²⁵⁴ UNESCO COMEST Report on the Ethics of Robotics, SHS/YES/COMEST-10/17/2 REV. Paris, 14 September 2017 Original: English. Available at: [\[Link\]](#).

²⁵⁵ European Economic and Social Committee 526th EESC Plenary Session of 31 May and 1 June 2017, Opinion of the European Economic and Social Committee on "Artificial intelligence: the impact of artificial intelligence on the (digital) single market, production, consumption, employment and society" (own-initiative opinion) (2017/C 288/01).

²⁵⁶ Diane Galbois-Lehalle, Master1 course "The concept of personhood".

have “a legal representative”.²⁵⁷ Therefore, the creation of a legal personhood to endow a LAWS with assets appears to be a complex detour that ultimately leads back to liability mechanisms involving human actors.

192. Assigning legal personhood to lethal autonomous robots faces major conceptual obstacles related to the absence of intentionality and free will, as well as practical difficulties resulting from the establishment of an autonomous legal and patrimonial regime. The abandonment of this idea by European institutions reflects these limitations and the need to explore other avenues for regulating liability in the field of military AI.

§ 2: Towards alternative accountability mechanisms for military AI systems

193. Given the limitations of the legal personhood approach, it is possible to explore alternative avenues for addressing the issue of responsibility for artificial intelligence systems, which could be adapted to the military context.

A) A dedicated asset base

194. One possible avenue is inspired by Roman law and the status of slaves. In Rome, slaves were legally treated as objects; they

²⁵⁷Alain Bensoussan, Charter of Robot Rights, V.5.0, September 2015. Available at [\[Link\]](#).

were not subjects of law, but rather objects of law.²⁵⁸ However, slaves could act legally on behalf of their masters, and Roman law had developed the concept of *peculium*, a form of assigned property whose value limited the master's liability for the actions of his slave.²⁵⁹

195. This system of allocated assets was also found in the status of limited liability sole proprietorships, where “*natural persons engaged in individual economic activity* were allowed, *by simple declaration, to allocate assets to their professional activity, thereby separating their personal assets from their professional assets.*”²⁶⁰ One of the advantages of this system is “*the limitation of liability granted to the trader.*”²⁶¹

196. Transposed to the field of LAWSs, one could envisage a mechanism whereby assets would be specifically allocated to the repair of damage caused by these systems, without however conferring legal personhood on them, contrary to Maître Bensoussan's proposal (see paragraph 191 *above*). Liability would remain with the designers, manufacturers or military authorities

²⁵⁸ Thierry Garé and Anaïs Raynaud, *Droit des personnes et de la famille* (Law of Persons and the Family), published by Spécial Droit, Col. Ellipses, 2nd edition, 2018.

²⁵⁹ Diane Galbois-Lehalle, “The Attraction of the Category of Persons to Digital Entities,” conference proceedings, *The Coveted Personality*, 2023. Available at [Link].

²⁶⁰ Dalloz guidance sheet, “Entreprise individuelle à responsabilité limitée” (Sole proprietorship with limited liability), July 2023.

²⁶¹ Jean Derruppé and Thibault de Ravel d'Esclapon, “Business assets,” October 2016, updated in January 2025, paragraphs 195-196. Real estate law directory, Dalloz Actualités.

deploying these systems and ultimately with the States, but could be limited to the value of the assets allocated.

B) Military AISs: neither person nor thing

197. Another interesting approach is that of “centres of interest” theorised by Gérard Farjat, which goes beyond the simple classification of person/thing.²⁶² The author argues that recognising these centres of interest, even if they do not have legal personhood, better reflects current realities and strengthens the effectiveness of the legal system. The concept of centres of interest has various legal foundations and effects. It can give rise to specific legal protection, greater than that granted to things, but not quite as great as that granted to persons. It can also imply “a *particular obligation, an extended responsibility*.”²⁶³ The attribution of rules, rights and obligations is a central aspect of this. Although only legal persons can be held liable for breaches of these rules, the acknowledgment of a centre of interests legitimises their application and extends liability to the legal entities that manage them.

198. Applied to AI-enabled human targeting weapon systems that are more or less autonomous, this perspective would make it possible to envisage specific forms of liability, depending on their degree of autonomy and the risks they present, without assimilating them to persons.

²⁶² Gérard Farjat, “Between people and things, centres of interest” RTD Civ. 2002 p.221. Available in PDF format.

²⁶³ *Ibid.*

199. Furthermore, Dean Carbonnier's concept of "non-subjects of law"²⁶⁴ highlights the possibility of disconnecting legal personhood from the status of subject of law. Thus, entities that do not have legal personhood could nevertheless be holders of rights and subject to specific obligations. In a military context, this could result in the establishment of clear rules concerning the expected behaviour of these systems, namely their compliance with the principles of IHL and the consequences of violating this law, without considering them as legal persons in their own right.

C) Are humans inevitably at the heart of responsibility?

1- Human programming, human responsibility

200. It is crucial not to neglect the responsibility of the human actors involved in the design, programming, deployment and control of these systems. The integration of ethical principles and IHL laws into the programming of military AIs, as well as the establishment of codes of conduct and effective human control systems, are essential means of preventing harm and assigning responsibility in the event of an incident.

201. In this regard, Asimov's laws, originally designed as an ethical framework to guide the behaviour of robots in their interactions with humans, state that

"1. A robot may not injure a human being or, through inaction, allow a human being to come to harm;

²⁶⁴ J. Carbonnier, Chapter 3, «Être ou ne pas être. Sur les traces du non-sujet de droit» (To be or not to be. On the trail of the non-subject of law), *Flexible droit*, L.G.D.J, 9th ed. 1998.

2. *A robot must obey the orders given to it by human beings, except where such orders would conflict with the First Law;*
3. *A robot must protect its own existence as long as such protection does not conflict with the first or second law."*

A fourth law, the Zero Law, is derived from the other three:

*"0. A robot may not harm humanity, or, through inaction, allow humanity to come to harm."*²⁶⁵

Drawing inspiration from these laws, "as applying to the designers, manufacturers and operators of robots, including robots with autonomy and self-learning capabilities"²⁶⁶ rather than to the robots themselves, emphasises the importance of anchoring responsibility and control in the human sphere.

202. Furthermore, in his Charter of Robot Rights, Mr Bensoussan states in Article 6 that "*The user of the robot is presumed responsible for the robot's actions unless proven otherwise. The liability of robots is subject to the common law of human liability in the following order:*

- *The robot user;*
- *The manufacturer of the artificial intelligence platform;*
- *The manufacturers of the robot's physical and intangible components;*
- *The owner of the robot."*²⁶⁷

This gradation reflects the idea that humans, at all levels of the chain, must remain responsible.

²⁶⁵ Isaac Asimov, first presented in his short story *Runaround*, 1942.

²⁶⁶ European Parliament resolution of 16 February 2017, *op. cit.*

²⁶⁷ Alain Bensoussan, Charter of Robot Rights, Lexing avocat, V 5.0, September 2015.

2- Liability for robots

203. Several authors suggest applying the regime of liability for things to robots. Patrick Lynn, Keith Abney and Georges Bekey believe that “*moral responsibility for the actions of a robot falls to the person who has given the robot permission to act on their behalf.*”²⁶⁸ In this sense, since the robot acts on behalf of a third party, it cannot be considered responsible in itself.²⁶⁹ Consequently, the theory of liability for robots’ action has been developed on the basis of Article 1243 of the Civil Code: “*The owner of a robot, or the person who uses it while it is used on his behalf, is liable for any damage caused by the robot, whether the robot was in his custody, or whether it was lost or escaped.*”²⁷⁰

Thus, it is no longer essential to propose a robotic or electronic legal personhood in order to attribute any liability to robots, since their owner will be liable. In the military area, “*the holder of military authority may therefore be held liable for acts committed by an autonomous system.*”²⁷¹

204. Nevertheless, there is a limit to this status. Actually, while the authority may be held liable, this will not happen automatically or in all cases. We return to *the* concept of *actus reus* and *mens rea*,²⁷² but this time applied to the military authority in charge of the LAWSs. As we have seen, a LAWS acts with complete autonomy,

²⁶⁸ P. Lin, K. Abey, G.A. Bekey, *Robot Ethics: The Ethical and Social Implications of Robotics*, Cambridge, MIT Press, 2014, cited by Laure de Roucy-Rochegonde, “War in the Age of Artificial Intelligence”, p.138.

²⁶⁹ Laure de Roucy-Rochegonde, *op. cit.* pp. 138–139.

²⁷⁰ MdN Ruffo, *Itinéraire d’un robot tueur (Journey of a Killer Robot)*, Edition Le Pommier/Humensis, 2018, p. 92

²⁷¹ Laure de Roucy-Rochegonde, *op. cit.*, p. 139.

²⁷² See paragraph 180 *above*.

from targeting to the lethal decision. Therefore, “*it would be difficult to prove intent, which presupposes that the hierarchical authority was aware of the unlawful acts before they were committed, that it did not act to prevent them, or that it did not subsequently punish the subordinate who committed them.*”²⁷³

205. Thus, if significant human control is established, *i.e.* a clear understanding of the LAWS’s actions and prior knowledge of its behaviour by the military authority in charge, then the liability regime based on the robot’s actions appears to be a relevant solution.

206. In conclusion, in the face of the challenges of liability posed by autonomous military AI systems, alternative mechanisms to the recognition of legal personhood appear more promising. In any case, “*for international humanitarian law, which governs armed conflicts, to apply, the use of a weapon must be linked to human responsibility.*”²⁷⁴ With specific regard to LAWSs, one of the eleven guiding principles established by the Governmental Expert Group emphasised that “*human responsibility in decisions relating to the use of weapons systems must be maintained.*”²⁷⁵

²⁷³ Laure de Roucy-Rochegonde, *op. cit.*, p. 139.

²⁷⁴ French Ministry for Europe and Foreign Affairs, «Systèmes d’armes létales autonomes, quelle est l’action de la France?» (Lethal autonomous weapons systems: French initiatives), February 2020; available at: [[Link](#)]

²⁷⁵ French National Assembly, Information Report No. 3248; *op. cit.*

Chapter 2: Towards a legal and ethical framework for military AI

207. The militarisation of AI calls for a rethinking of its regulatory framework, through the creation of a dedicated legal framework (Section 1) and a reminder of the unavoidable limits imposed by international humanitarian law (Section 2).

Section 1: A unique legal corpus specific to military AI

208. L'élaboration d'un cadre juridique propre à l'IA militaire peut s'appuyer sur des principes existants comme la clause de Martens pour formuler un complément des lois de la guerre (§1), tout en nécessitant une rationalisation des normes applicables (§2).

§ 1: The Martens clause or a supplement to the laws of war

209. The Martens Clause first appeared in the preamble to the Second Hague Convention of 1899. In its original wording, the Martens Clause states:

*“Until a more complete code of the laws of war is issued, the High Contracting Parties think it right to declare that in cases not included in the Regulations adopted by them, populations and belligerents remain under the protection and empire of the principles of international law, as they result from the usages established between civilized nations, from the laws of humanity, and the requirements of the public conscience.”*²⁷⁶

²⁷⁶ Convention (II) concerning the Laws and Customs of War on Land and its Annex: Regulations concerning the Laws and Customs of War on Land. The Hague, 29 July 1899.

210. This clause is of major importance, in that it constitutes *the “only provision of international humanitarian law that establishes a basis for the protection of civilians and combatants when a situation is not covered by any legal text.”*²⁷⁷

211. Over the decades and successive armed conflicts, the Martens clause has consistently proved its usefulness, while its meaning has evolved according to the interpretations that have been made of it.

A) Different interpretations of the Martens Clause

1- Narrow meaning

212. In its narrowest interpretation, the Martens clause recalls that customary international law remains applicable,²⁷⁸ particularly when treaty law leaves certain issues uncoded or does not address them explicitly.²⁷⁹ This interpretation is unconvincing in two respects. Firstly, because this interpretation is based solely on custom and overlooks the laws of humanity and the requirements of public conscience, rendering these principles ineffective.²⁸⁰ Finally, because *“the clause itself cannot serve as a basis for prohibiting a*

²⁷⁷ Human Rights Watch, “Answering the Call: The Moral and Legal Imperative to Ban Killer Robots,” 2018. Available in PDF format.

²⁷⁸ C. Greenwood, “Historical Development and Legal Basis,” in: *The Handbook of Humanitarian Law in Armed Conflict*, Dieter Fleck (ed.), Oxford University Press, Oxford/New York, 1995, p. 28 (para. 129), cited by Rupert Ticehurst in his article “The Martens Clause and the Law of Armed Conflict” published in the *International Review of the Red Cross*, pp. 133-142.

²⁷⁹ Marcus Hickleton, “Shaky foundations: ‘killer robots’ and the Martens Clause,” *Perth International Law Journal*, vol. 4, January 2019, p. 44. Available at [Link].

²⁸⁰ *Ibid.*

*weapon, as such a prohibition must be based on an existing customary or conventional norm.”*²⁸¹ Given that there is currently no customary norm on LAWSs, they cannot be banned under this clause.

2- Broad interpretation

213. According to its broadest interpretation, an action is not automatically legal simply because no treaty explicitly prohibits it.²⁸² This view is shared by States such as the United Kingdom, which, in its written observations in an advisory opinion of the International Court of Justice on the legality of the threat or use of nuclear weapons, drafted on 8 July 1996, stated that “*the Martens clause clearly stipulates that the absence of a specific conventional prohibition on the use of nuclear weapons does not mean that their use is authorised.*”²⁸³ The clause would therefore impose a minimum threshold of protection for civilians and combatants, based not only on written rules but also on implicit moral and humanitarian obligations,

²⁸¹ T. McFarland, *op. cit.*, note 101 on p. 104. Quoted by Julien Grenon, “Autonomous Weapon Systems and International Humanitarian Law: A Contested Legality”, p. 45.

²⁸² Y. Sandoz, C. Swinarski, B. Zimmermann (eds.), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949*, ICRC/Martinus Nijhoff, Geneva, 1986, pp. 38-39 (para. 55); N. Singh and E. McWhinney, *Nuclear Weapons and Contemporary International Law*, 2nd ed. Martinus Nijhoff, Dordrecht, 1989, pp. 46-47 cited by Rupert Ticehurst in his article “The Martens Clause and the Law of Armed Conflict”, published in the *International Review of the Red Cross*, pp. 133-142.

²⁸³ Letter dated 16 June 1995 from the Legal Adviser to the Foreign and Commonwealth Office of the United Kingdom of Great Britain and Northern Ireland, with written observations from the Government of the United Kingdom, p. 48, available at: [\[Link\]](#).

designed to avoid consequences that are unacceptable from a humanitarian perspective.²⁸⁴

3- Moderate meaning

214. The moderate interpretation of the Martens clause, which is generally accepted in international law,²⁸⁵ considers that this provision does not constitute an autonomous source of law, but that it plays an important role as a tool for interpreting existing norms of international humanitarian law.²⁸⁶ In situations where conventional or customary rules are ambiguous, incomplete or subject to multiple interpretations, the clause induces judges to favour the interpretation that is most consistent with the principles of humanity and the requirements of public conscience,²⁸⁷ understood as “*the conception that a population has of good and evil.*”²⁸⁸ It therefore does not in itself prohibit a weapon or conduct in the absence of clear regulations, but it can reinforce or guide the application of existing rules in cases of doubt as to their interpretation.

Furthermore, the requirements of public conscience alone do not allow for the prohibition of LAWSs, as it is difficult to

²⁸⁴ CCW, working paper submitted by Switzerland, “A ‘Compliance-Based’ Approach to Autonomous Weapon Systems”, CCW/GGE.1/2017/WP.9, UN, 10 November 2017. Paragraph 18. Available in PDF format at [[The link](#)].

²⁸⁵ Marcus Hickleton, “Shaky foundations: ‘killer robots’ and the Martens Clause”, p. 48, *op. cit.*

²⁸⁶ Marcus Hickleton, “Shaky foundations: ‘killer robots’ and the Martens Clause”, p. 45, *op. cit.*

²⁸⁷ Antonio Cassese, “The Martens Clause: Half a Loaf or simply Pie in the Sky?” *European Journal of International Law*, Volume 11, Issue 1, 2000, Pages 187–216, p. 212. Available in PDF format at [[The link](#)].

²⁸⁸ Laure de Roucy-Rochegonde, p.191, *op. cit.*

*“determine the opinion of citizens in all countries of the world”*²⁸⁹ and, above all, because they fluctuate depending on the context. On this point, a survey conducted by Michael Horowitz shows that *“the citizens surveyed were also much more inclined to support the use of autonomous weapons when it was suggested that their use would protect American forces.”*²⁹⁰

215. It therefore seems unlikely that the Martens Clause could prohibit the use of LAWSs in light of the requirements of public conscience.

B) A new exclusive legal framework

216. Even if the Martens Clause does not directly create new laws, it is valuable for interpreting and bringing about changes in international humanitarian law, especially in areas where new technologies pose ethical or legal challenges.²⁹¹

217. Thus, beyond the legal interpretation of the Martens Clause, it is worth dwelling on its first sentence: *“until a more complete code of the laws of war can be enacted [...]”*. This reference suggests that the clause was never intended to be a definitive foundation, but rather a transition in the absence of more precise standards. Consequently, rather than simply applying it by extension to AI-enabled autonomous weapons systems, whether lethal or non-lethal, it now seems necessary to set about drafting a genuine legal

²⁸⁹ Laure de Roucy-Rochegonde, p. 192, *op. cit.*

²⁹⁰ M.C. Horowitz, “Public Opinion and the Politics of the Killer Robots Debate,” *Research & Politics*, 3/1, 2016, p.1-8, cited by Laure de Roucy-Rochegonde, *op.cit.*, p.193.

²⁹¹ Joanne Kirkham, “Lethal Autonomous Weapons Systems: An International Law Study,” 10 December 2022, paragraph 99, *op. cit.*

corpus adapted to contemporary technological realities. Indeed, it seems irrelevant to continue to invoke a provision from the 1899 Hague Conference to regulate the use of technological tools as complex and recent as AI-enabled autonomous weapons systems.

218. In light of this reflection, another course would be to develop an autonomous legal framework specifically designed to regulate the military use of artificial intelligence and LAWSs.

219. In this context, a relevant approach would be to adapt certain existing civil regulations, particularly those derived from European law, to the military. For example, the European Regulation on Artificial Intelligence of 13 June 2024, which does not apply to the military,²⁹² could nevertheless serve as a working basis. Although this does not involve mechanically transposing a civil regulation into a context of armed conflict, the requirements for “high-risk” systems could inspire a rigorous management of military AI systems. This approach would allow for a compromise between technological innovation and compliance with the fundamental principles of international humanitarian law, without necessarily going as far as an outright ban on LAWSs.

220. One of the key requirements of the European regulation, set out in Article 4, is “AI mastery”, which requires suppliers and users of high-risk systems to ensure that their personnel have a sufficient level of competence, based on their training and the

²⁹² Bensamoun, Alexandra and Loiseau, Grégoire, *Droit de l'intelligence artificielle* (Artificial Intelligence Law), 2nd edition. - Paris La Défense: LGDJ, a Lextenso publication, DL 2022. - 1 vol. (594 p.).

operational context.²⁹³ Such a requirement would meet the expectations expressed by the Group of Governmental Experts meeting under the CCW, particularly with regard to the explainability of systems. Article 14 of the regulation also provides for increased human supervision, in line with the principles advocated in the Council of Europe's draft resolution, according to which LAWSs must remain predictable in order to comply with the precautionary principle.²⁹⁴ These principles would also make it possible to hold humans truly accountable.

221. Other provisions of the European AI Act, such as risk management (Article 9), technical documentation promoting explainability (Article 11), and guarantees of accuracy, robustness and cybersecurity (Article 15), could also be transposed, or at least adapted, to the specificities of military systems. The aim would then be to ensure significant human control while allowing for regulated, controlled use in line with contemporary operational requirements.

²⁹³ Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Regulation on artificial intelligence) (Text with EEA relevance). Available at [[Link](#)].

²⁹⁴ Council of Europe, Committee on Legal Affairs and Human Rights, "The emergence of lethal autonomous weapon systems (LAWS) and their necessary apprehension by European human rights law", Draft resolution adopted unanimously by the Committee on 14 November 2022. Available in PDF format at [[The link](#)].

222. Such a proposal could be a point of convergence between States that favour a strict legal framework, without prohibiting the use of LAWSs, and those that advocate their development within an ethical and responsible framework. By reconciling legal requirements and technological flexibility, this approach would offer a pragmatic response to the challenges posed by the growing integration of AI in armed conflicts.

§ 2 *Ways to streamline*

A) Existing instruments for regulating LAWSs

223. The regulation of lethal autonomous weapons systems is currently based on a variety of institutional and normative initiatives. The first warnings were issued by the designers themselves, before being taken up by non-governmental organisations such as Amnesty International, calling for their prohibition. Steps have also been taken by some states to bring this issue to the international agenda, notably by France in 2013 at the Conference on Disarmament. The main framework remains the Convention on Certain Conventional Weapons, described as “*the key instrument of international humanitarian law*”²⁹⁵ because of its aim to “*strike a balance between military requirements and humanitarian considerations.*”²⁹⁶ During a webinar organised by the United Nations Office for Disarmament Affairs, Ms Lindholdt Hove Rietveld recalled in her opening remarks that the European Union decided in 2021 to strengthen and support the Convention on Certain

²⁹⁵ GGE LAWS- General Statement: Address by Ambassador Camille Petit (Geneva, 26 August 2024). Available at [[The link](#)].

²⁹⁶ *Ibid.*

Conventional Weapons. It was also stated that, from this perspective, the Group of Governmental Experts is the most appropriate forum for discussions on lethal autonomous weapons systems.²⁹⁷

224. This convention, thanks to its flexible structure, would allow for a certain degree of adaptability to “emerging technologies as regards LAWSs.”²⁹⁸ Within this framework, the Group of Governmental Experts adopted eleven guiding principles in 2019, reaffirming the need to respect international humanitarian law and human responsibility. It was also emphasised that “*the concept of meaningful human control is a central issue*”²⁹⁹ in these discussions. However, these principles are not binding, which limits their normative scope.³⁰⁰ Furthermore, some States, such as China, have expressed their support for a legal instrument, provided that it is “*only within the Convention on Certain Conventional Weapons*”,³⁰¹ which illustrates the persistence of a conservative approach within this forum.

²⁹⁷ Webinar of United Nations, Office for Disarmament Affairs, “Experts Reflect on Novel Approaches to “Meaningful Human Control, 7 March 2023. Available at: [\[The link\]](#).

²⁹⁸ Nathalia A. Smuha, *The Cambridge Handbook of the Law, Ethics and Policy of Artificial Intelligence*, Cambridge University Press, April 2025, Chapter 20 “Artificial Intelligence and Armed Conflicts”, Katerina Yordanova, pp. 411-428.

²⁹⁹ *Ibid.*

³⁰⁰ *Ibid.*

³⁰¹ United Nations, “First Committee: countries stress importance of considering ethical and humanitarian dimensions of certain conventional weapons”, AG/DSI/3748, 24 October 2024. Available at [\[Link\]](#).

B) Effectiveness called into question

225. Despite the existence of these instruments, their effectiveness remains limited in the face of the accelerating development of LAWSs. Due to its consensus-based operating mode, the CCW faces numerous obstacles.³⁰² It has been observed that “in view of the deadlock in the CCW, the issue of autonomous weapons is being discussed in other United Nations forums,”³⁰³ notably in the General Assembly, which adopted resolutions in 2023³⁰⁴ and 2024³⁰⁵ that were widely supported by States. Although these resolutions do not yet initiate formal negotiations, they have shifted the debate to a framework where “decisions are taken by majority vote,”³⁰⁶ thus avoiding systematic obstruction. In December 2024, a resolution was adopted by 166 votes, providing for informal discussions in 2025³⁰⁷ and “*decides to include in the provisional agenda of its eightieth session the item entitled ‘Lethal autonomous weapons systems’.*”³⁰⁸

³⁰² Laure de Roucy-Rochegonde, “Military and Ethical Use of AI & International Law”, Master 2 Course on Artificial Intelligence Law.

³⁰³ Aymeric Elluin, “The urgent need for a treaty regulating autonomous weapon systems,” 13 January 2025. Available at [\[Link\]](#).

³⁰⁴ United Nations General Assembly, “Resolution adopted by the General Assembly on 22 December 2023,” A/RES/78/241. Available in PDF format at [\[Link\]](#).

³⁰⁵ United Nations General Assembly, “Resolution adopted by the General Assembly on 2 December 2024,” A/RES/79/62. Available in PDF format at [\[Link\]](#).

³⁰⁶ Aymeric Elluin, “The urgent need for a treaty regulating autonomous weapons systems,” *op. cit.*

³⁰⁷ United Nations General Assembly, 2 December 2024; *op. cit.* p. 3, para. 7.

³⁰⁸ *Ibid.* p. 4, para. 12.

226. In light of historical precedents, such as the 1997 Ottawa Treaty and the 2008 Oslo Treaty, which have significantly reduced or even banned the proliferation of anti-personnel mines and cluster munitions,³⁰⁹ a new treaty on LAWSs would be “*the only realistic means of achieving robust legal standards in the near future.*”³¹⁰ In this view, the International Committee of the Red Cross and the United Nations Secretary-General are calling for “*new agreements on these weapons to be negotiated before 2026.*”³¹¹

Section 2: The absolute limits of IHL

227. However, although mechanisms exist to adapt IHL to the era of military AI, the limits of international humanitarian law are as much a function of the strategic and sovereignty imperatives of States (§1) as of their political will to comply with it or not (§2).

§ 1: Strategic and sovereignty issues

A) Military AI as a lever for technological superiority and deterrence

228. Artificial intelligence implemented for military technologies is gradually establishing itself as a key factor in strategic superiority. Integrated into LAWSs, AI not only enhances

³⁰⁹ Aymeric Elluin, “The urgency of a treaty regulating autonomous weapons systems,” *op. cit.*

³¹⁰ *Ibid.*

³¹¹ United Nations, “UN and Red Cross call for unprecedented international agreement on autonomous weapons,” 5 October 2023. Available at [Link].

the accuracy and speed of operations,³¹² but also compensates for certain structural constraints, such as the reduction in military personnel due to recruitment difficulties and “*the growing reluctance of Western nations to risk the lives of their soldiers in foreign theatres of operation.*”³¹³ The development of LAWSs is thus generating sustained military interest, to such an extent that some observers see it as the beginning of a new revolution in warfare techniques.³¹⁴ In a context where rapid technological advances are enabling the designing of systems that can supplement or even replace humans in combat, “killer robots” appear to be a pragmatic response to modernisation requirements.³¹⁵ In this context, a group of influential specialists in artificial intelligence and robotics had already warned in 2015 that “*artificial intelligence technology has reached such a level that the deployment of these systems is – practically, if not legally – conceivable in the coming years, rather than decades,*”³¹⁶ emphasising that these weapons could constitute “*the third revolution in warfare, after gunpowder and nuclear weapons.*”³¹⁷ Military AI is therefore not just a tool for efficiency: it is becoming a lever of power, a deterrent, a symbol of technological leadership, and “*is emerging as the main route*

³¹² Library of Parliament of Canada, Ariel Shapiro, “Autonomous Weapons Systems: Some Implications for International Security and Canada,” 20/12/2019. Available at [\[Link\]](#).

³¹³ Dominique Lambert, p.38, *op.cit.*

³¹⁴ Laure de Roucy-Rochegonde, “Lethal autonomous weapons systems: will there be a French Terminator?”, 225/09/2020. Available at [\[Link\]](#).

³¹⁵ *Ibid.*

³¹⁶ Autonomous Weapons Open Letter: AI & Robotics Researchers, 9 February 2016. Available at [\[Link\]](#).

³¹⁷ *Ibid.*

to tactical superiority.”³¹⁸ States that choose to reject the development of these technologies on principle would therefore expose themselves to strategic downgrading,³¹⁹ and this refusal could be interpreted as a vulnerability at a time when mastery of military AI is gradually being integrated into the national security doctrines of several powers.

B) Tensions between refusal to interfere legally and compliance with IHL obligations

229. By becoming parties to the Geneva Conventions, Article 1¹common to all the Geneva Conventions stipulates that “*The High Contracting Parties undertake to comply and to ensure compliance with the present Convention in all circumstances.*”³²⁰ This obligation stems from a fundamental rule of international law, *pacta sunt servanda*,³²¹ provided for in Article 26 of the Vienna Convention of 23 May 1969, and implies applying their treaty commitments in good faith. It cannot be rendered meaningless by reservations in favour of state security or military necessity.³²² On the other hand, despite a joint appeal by the Secretary-General of the United Nations and the ICRC urging “*political leaders to urgently establish specific prohibitions and limitations on autonomous weapons systems in order to protect*

³¹⁸ Jean-Christophe Noël, “Artificial intelligence: towards a new military revolution?”, *op. cit.*

³¹⁹ Laure de Roucy-Rochegonde, “Autonomous lethal weapons systems: will there be a French Terminator?”, *op. cit.*

³²⁰ Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, 12 August 1949, I, Article 1.

³²¹ Vienna Convention on the Law of Treaties, Vienna, 23 May 1969. Article 26.

³²² Abdelwahad Biad, *International Humanitarian Law*, ed. Ellipses, coll. “Mise au point”, 2nd edition, 2006, p. 82.

*humanity*³²³ before 2026, major military powers such as the United States, China and Russia have indicated that they reserve the right to develop such systems. These positions reflect a lack of intention on the part of these dominant actors to be committed to a binding legal framework limiting the use of military AI or to slow down their investments in this strategic area.³²⁴ However, this reality is at odds with the initiatives of the UN and the ICRC and can be explained in particular by military strategy, based on the logic of geopolitical rivalry and the competitive dynamics that characterise the current international system.³²⁵ Ultimately, the effectiveness of international humanitarian law clashes with the logic of power and the imperatives of technological sovereignty, revealing a structural tension between the legal obligations of states and contemporary geopolitical dynamics based on strategic competition.

§ 2. *States' willingness to comply with IHL or not*

A) Factors determining states' compliance with IHL

230. Apart from the conventional obligations that states must comply with, the promotion of compliance with IHL can be based on other mechanisms such as transparency, accountability and international pressure. Compliance with the principle of transparency in the conduct of military operations, as well as the communication of relevant information, strengthens the legitimacy

³²³ United Nations, “UN and Red Cross call for unprecedented international agreement on autonomous weapons,” 5 October 2023, *op.cit.*

³²⁴ Thierry Berthier, “The UN wants to regulate military artificial intelligence but faces the principle of competitive reality,” *Conflits magazine*, published 13 August 2023. Available at [[Link](#)].

³²⁵ Thierry Berthier, *Conflits magazine*, *op. cit.*

of armed actors who wish to be perceived as legitimate interlocutors or representatives. From this perspective, compliance with the law of armed conflict becomes a strategic lever for establishing this recognition.³²⁶ Accountability, for its part, implies that violations of IHL are effectively punished. Indeed, “*serious violations of IHL constitute international crimes, which are not subject to any statute of limitations or amnesty, and entail reparation and punishment.*”³²⁷ Therefore, sanctions for violations of IHL are, at a minimum, a means of enforcing it.

231. Furthermore, the influence of national and international public opinion plays a crucial role in assessing the conduct of States. States are concerned about their image and political choices in the eyes of the international community and their own populations, which may prompt them to act in accordance with IHL in order to “*win the support of the population.*”³²⁸

In short, these interconnected mechanisms are essential levers for encouraging States to comply with IHL by building trust, ensuring justice and mobilising the international community around fundamental humanitarian principles.

³²⁶ Madalena Vasconcelos Rosa and Juliane Garcia Ravel, “IHL in action: seven factors that can influence behaviour with a view to strengthening compliance with international humanitarian law,” 19 November 2020. Available at [\[Link\]](#).

³²⁷ David Cumin, *Manual on the Law of War*, p. 160, *op. cit.*

³²⁸ Madalena Vasconcelos Rosa and Juliane Garcia Ravel, *op. cit.*

B) *Selective compliance with IHL according to political and operational interests*

232. Conversely, compliance with international humanitarian law is often far from absolute and may be selectively applied or interpreted according to the political and operational interests of States and belligerents.³²⁹ Belligerents sometimes tend to favour a transactional approach or invoke exceptionalism rather than strict compliance with the rules, declaring that they will respect the law only if the opposing party does the same, or asserting that the adversary is so harmful that provisions limiting the use of force can be ignored.³³⁰ This tendency is also evident in relation to new technologies of warfare, as illustrated by the debate about lethal autonomous weapons systems. For international regulation of LAWSs to be effective, the adherence of all the military powers concerned is required.³³¹ However, as experience has shown with other attempts at regulation, such as the Ottawa Convention on Anti-Personnel Mines or the Oslo Convention on Cluster Munitions, the major military powers concerned have often failed to adhere to them.³³² This highlights how national and military

³²⁹ Duncan McLean and Michiel Hofman, “International Humanitarian Law, State Sovereignty and the Erosion of Humanitarian Consensus: The End of Humanitarianism?”, published in Issue 23 – *International Humanitarian Law: The Great Comeback... Backwards? Humanitarian Alternatives Review*. Translated from English by Sophie Jeangeorges. Available at [\[Link\]](#).

³³⁰ Address by Peter Maurer, President of the ICRC, Centre for Strategic and International Studies, Washington DC, 10 May 2019. Translation of the transcript. “Are the rules of war a thing of the past?” 10/05/2019. Available at [\[Link\]](#).

³³¹ French National Assembly, information report no. 3248, *op. cit.*

³³² *Ibid.*

interests can take precedence over universal regulation efforts.³³³ Furthermore, a preventive ban targeting only states may not prevent terrorist groups, which are not bound by such obligations, from using LAWSs, thereby discouraging military powers from being committed in a regulatory process.³³⁴ These dynamics reflect the challenges of ensuring the relevance and respect of IHL in a world where competition between powers is intensifying and conflicts are becoming increasingly fragmented and complex.³³⁵

233. Conclusion of Part 2. Ultimately, the integration of military AI, and in particular LAWSs, places a strain on IHL due to the erosion of human control and responsibility. While alternative legal avenues to legal personhood for machines exist to regulate responsibility, and while a new normative framework inspired by civil regulations is conceivable, the actual compatibility of these systems with IHL will *ultimately* depend on the ability of States to maintain meaningful human control, to guarantee human accountability in the event of violations, despite technical and ethical challenges and strong geopolitical pressures, and above all on their willingness to comply with IHL.

³³³ *Ibid.*

³³⁴ *Ibid.*

³³⁵ Speech by Peter Maurer, *op. cit.*

Conclusion

234. The rise of artificial intelligence in the military sphere, particularly for human targeting, raises profound technical, legal and geopolitical challenges in the context of international humanitarian law. The central question is whether this framework, which stems from a long-standing tradition, can still effectively regulate these new technologies. In a context of arms race, differences between States are hindering the emergence of a consensus on regulation. Given these limitations, the adaptation of IHL seems inevitable, whether through a legal framework specific to military AI or through the adjustment of existing standards. In the absence of rapid agreement within the CCW, alternatives such as a binding treaty on LAWSs or transparency and accountability mechanisms appear essential to preserve fundamental humanitarian principles.

235. Ultimately, the compatibility of human targeting AISs with IHL has not yet been achieved and will depend on the international community's ability to adapt the normative framework. The technical limitations of current AI, the erosion of human control induced by the acceleration of operations and cognitive biases, and the difficulty of assigning legal responsibility are major obstacles to compliance with the fundamental principles of IHL. Although some believe that it is possible to programme AI systems in accordance with IHL, the inability of AI to make ethical and contextual judgements makes this task extremely difficult, if not impossible, for complete autonomy. Nevertheless, the need to maintain effective human control over lethal decisions and to ensure accountability in the event of violations of IHL is an ethical

and legal red line that States must uphold. The future of IHL in the era of military AI depends on a delicate balance between technological innovation and the need to protect humans in armed conflict. The compliance of AISs with IHL is uncertain, but not impossible if States work collectively to adapt the law and establish a robust ethical framework, ensuring that humans remain in control of lethal decisions.

236. Although the issue of regulating LAWSs is not new, it has taken on greater significance today with the emergence of new forms of AI. While some had previously argued that LAWSs did not actually exist, the emergence of agentic AI, in which “*artificial intelligence moves from the status of assistant to that of actor [and] becomes capable of thinking, planning and acting to achieve a goal*,”³³⁶ calls this perspective into question. More than an adaptation of IHL, it will certainly be necessary to reconsider the codes of war, not for humans but for military AI.

³³⁶ Julien Perez, professor at the EPITA Research Laboratory (school for computer science and advanced techniques). EPITA News, “AI agents, a major turning point for artificial intelligence,” 05/05/2025. Available at [[The link](#)].

Afterword

Edited on May 27th 2026

The recent publication of Pope Leo XIV's encyclical letter *Magnifica Humanitas*,³³⁷ and more specifically its developments concerning *Weapons and AI*, offers valuable insight into the ethical issues raised by the rise of artificial intelligence in the military domain. Released one year after the writing of this thesis, it confirms its relevance and shows that the legal and ethical questions surrounding the use of AI in armed conflict remain at the heart of international concerns. This position taken by the Holy See extends the reflection undertaken in this thesis, reminding us that technologies are never neutral and that their integration into the conduct of war reflects a particular vision of humanity. In this sense, the encyclical constitutes an essential moral reference point in a debate where technical and strategic considerations sometimes overshadow the profoundly human dimension of the military use of AI, particularly in human-targeting systems.

The analysis developed in this thesis largely aligns with the concerns expressed by Pope Leo XIV, especially regarding the risks of eroding human control, fostering irresponsibility, and dehumanizing armed conflict. The encyclical emphasizes that AI may make war “more feasible” and lower “the threshold for

³³⁷ Encyclical letter *Magnifica Humanitas* of His Holiness Pope Leo XIV on safeguarding the human person in the time of artificial intelligence, Rome, at Saint Peter's, on 15 May, in the year 2026. Available [[Here](#)].

resorting to violence,” by turning victims into “data.” This critique echoes the findings presented in this thesis on the potential limitations of autonomous weapon systems and AI-based targeting tools, whose opacity, speed of execution, and optimization logic may weaken the fundamental principles of IHL, particularly the principles of distinction, precaution, and proportionality. Thus, the encyclical and this thesis converge in denouncing the dangers of automation that risks erasing the moral dimension of human judgment.

In response to these risks, the Holy Father’s letter insists on the need to preserve effective, conscious, and responsible human control, rejecting any delegation of lethal decision-making to opaque or automated processes. This requirement resonates with the proposals developed in this thesis, structured around meaningful human control and criteria such as transparency, traceability, robustness, and human supervision, themselves inspired by the AI Act framework and adapted to military realities. The human person must remain the responsible actor, the one who ultimately decides and protects the dignity of the other, even in the midst of conflict. AI may inform and assist, but it can neither discern nor bear the moral burden of armed violence.

Ultimately, the encounter between *Magnifica Humanitas* and this thesis reveals a shared conviction: the human being must remain at the center of all decision-making. In this research, this requirement translates into the adaptation of international humanitarian law to the use of AI in armed conflict. IHL can still respond to the challenges posed by these technologies, provided it is strengthened, clarified, and reaffirmed. Both the encyclical and this thesis therefore call for constant ethical and legal vigilance, so that the power of machines never supplants human conscience.

Magnifica Humanitas thus reinforces the conclusion of this thesis: even in the face of the growing automation of war, responsibility and moral judgment must remain fundamentally human.

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This research thesis examines the challenges posed by the rise of artificial intelligence (AI) to international humanitarian law (IHL), with a particular focus on AI systems applied to human targeting. Adopting an approach that combines legal, technical, and ethical perspectives, it analyzes the compatibility of autonomous lethal weapons systems and human-supervised decision-support tools with the fundamental principles of IHL, such as distinction, proportionality, and precaution.

The study highlights how these technologies, capable of assisting or even replacing human intervention, call into question the very foundations of the law of armed conflict, which was historically designed to be implemented by human actors. It underscores the difficulties of integrating such systems into the existing legal framework, due to their technical limitations—algorithmic opacity, uncertain reliability, and embedded biases—as well as the legal challenges and geopolitical tensions they generate.

In this context, the thesis questions the ability of IHL to effectively regulate these new technologies in operational settings. It emphasizes the need to preserve meaningful human control and examines issues of accountability in the event of system failure. In light of divergences between States and the lack of international consensus, it highlights the urgency of adapting the current legal framework.

This work thus offers an in-depth reflection on the future of IHL in the age of artificial intelligence, at the intersection of legal requirements, operational constraints, and ethical considerations.

This thesis has been awarded the first prize of the year 2026 in EuroISME's annual contest for the Manfred Rosenberger prize for best student's thesis (MA) written on military ethics. For information about the contest, please visit www.euroisme.eu

