



UNIVERSIDADE CATÓLICA PORTUGUESA

Autonomous Weapon Systems and International Law: refusing impunity.

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Ao Alois, que tornou a realização dos meus sonhos possível.

Ao meu avô, que levarei para sempre no meu coração.

To Alois, without whom this wouldn't be possible.

To my grandfather, who I'll carry forever in my heart.

"Scientia potentia est".

Abstract

More than ever, the competition to lead the technological race puts artificial intelligence in the centre of the global power play. The idea of a potential mortal weapon system that does not require a human agent on the loop is far from being just an academic hypothesis and the question arises on whom to allocate responsibility for its unlawful acts.

Being a current topic, transversal to several legal and ethical issues, the focus of the present dissertation will remain on the possibility of accountability for Autonomous Weapon System's unlawful acts in International Armed Conflicts.

Keywords: Artificial Intelligence; Autonomous Weapon Systems; International Humanitarian Law; Accountability; International Criminal Law; State's Responsibility.

Resumo

Atualmente, mais do que nunca, a competição para liderar a corrida tecnológica coloca a inteligência artificial no centro do poder global. A ideia de um sistema de armamento autônomo que não requer a intervenção de um agente humano durante a sua operação está longe de representar uma mera hipótese acadêmica levantando-se, assim, a questão de saber a quem imputar a responsabilidade por atuações ilegais.

Sendo um tópico atual, transversal a várias questões éticas e jurídicas, o foco da presente dissertação permanecerá na possibilidade de imputação da responsabilidade por atos ilegais de sistemas de armamento autônomo em situação de Conflito Armado Internacional.

Palavras-Chave: Inteligência Artificial; Sistemas de Armamento Autônomos; Direito Internacional Humanitário; Responsabilidade; Direito Internacional Criminal; Responsabilidade do Estado.

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Table of Contents

Acronyms	10
Introduction	12
1. Conceptual Complexity.....	14
1.1 Defining Artificial Intelligence.....	14
1.2 Autonomous Weapon Systems	15
1.2.1.Addressing the different typologies of AWS.....	16
2. AI in Warfare: Challenges posed to International Law	20
2.1 Regulation versus Total Ban of AWS	21
3. Relevant Legal Framework	24
3.1. <i>Jus ad Bellum</i>	24
3.2. <i>Jus in Bello</i> and International Human Rights Law	25
3.3. International Criminal Law.....	26
4. Ascertaining the legality of AWS under IHL.....	27
4.1. Martens Clause	27
4.2. Principles of International Humanitarian Law.....	28
A. Principle of Proportionality	29
B. Principle of Distinction	29
4.2.1. Preliminary conclusions: can AWS be considered categorically prohibited under IHL.	30
4.3. The obligation of weapons review: particular challenges	34
5. General Remarks on Accountability	36
5.1. Elements of international criminal accountability	36
A. Legality Principle	36
B. Mental element/ <i>mens rea</i>	37
6. International Responsibility for unlawful acts carried through AWS	39

6.1. Ascertaining States Responsibility for AWS unlawful acts	40
6.2. Individual Criminal Responsibility	43
A. Programmer	44
B. Command Responsibility	46
6.3. Relations between individual and State Responsibility	48
6.4. Preliminary Conclusions on Accountability for AWS unlawful acts	49
7. Refusing Impunity	51
7.1. International Binding Protocol on the development and deployment of weapons capable of operating autonomously	51
7.2. International Political Declaration	53
Conclusion	55
Bibliography and List of References	57

Acronyms

AI: Artificial Intelligence

AP: Additional Protocol

ARSIWA: Articles on the Responsibility of States for Internationally Wrongful Acts

Art. °: article

AWS: Autonomous Weapon Systems

CCW: Convention on Certain Conventional Weapons

Ed.: edition

Et seq.: and what follows

GEE: Group of Group of Governmental Experts

IAC: International Armed Conflict

Ibid.: in the same source

ICC: International Criminal Court

ICJ: International Court of Justice

ICL: International Criminal Law

i.e.: that is

IHL: International Humanitarian Law

IHRL: International Human Rights Law

IL: International Law

ILC: International Law Commission

IO: International Organizations

LAC: Law of Armed Conflicts

LAWS: Lethal Autonomous Weapons Systems

LoN: League of Nations

NCSL: *nullum crimen sine lege*

NGO's: Non Governmental Organizations

No.: number

OODA: Orient, Observe, Decide, Act.

Op. Cit.: In the work cited

P.: page

PP.: pages

Parag.: paragraph

RoE: Rules of Engagement

S.d.: (*sine data*)

UDHR: Universal Declaration of Human Rights

UN.: United Nations

U.S.: United States

Vol.: volume

WW: World War

Introduction

Not so long ago, the world witnessed catastrophic consequences caused by the unpredictability of war. During the World War II thousands of people lost their lives and generations disappeared from the Earth in the hands of ethnic cleansing and mass extermination politics.

At the time, Nazi leaders were held responsible for crimes against humanity and war crimes, but not under the crime of Genocide, leading Winston Churchill to remark that we were “in the presence of a crime without a name”.

If in fact at the time the Law could have not foreseen what eventually happened, the same cannot be stated about the eminent use of Autonomous Weapon Systems (AWS) in the battlefield and the complex challenges that poses to the Law.

AWS are fundamentally different from previous forms of weaponry, being the main difference the fact that it doesn't simply react to triggers. In fact, AWS are being developed to perform in a warfare context without relying on direct human input and with the ability of self-learning while operating.

As fascinating and almost herculean as those capabilities may be, the fact that those who plan a military operation have less influence than they previously had, along with the paradox created by the increased levels of autonomy¹, poses major challenges to international legislators regarding the assignment of accountability.

While the context of war may be unimaginable for some, it is catastrophic for all. And even if the establishment of world peace is not realistically possible, there should be at least, some peace in knowing that those who commit crimes will be held responsible.

But due to its inherent characteristics, it does not appear clear who could be held accountable for an illegal act where no human agent engaged directly. Faced with the vast possibility of holding responsible engineers, programmers, manufacturers, robot

¹Wagner, M. “The Dehumanization of International Humanitarian Law: Legal, Ethical, and Political Implications of Autonomous Weapon Systems”, *Vanderbilt Journal of Transnational Law*, Vol. 47, No 1371 (2014), 1371-1424. P.1400.

controllers or supervisors, state governments or commanders², some authors even add that this might be the first time a “weapon system will have either no one or too many people to held accountable for mistakes”.³

Given that some argue that in many scenarios we would be facing an “accountability gap”, there is a pressing need to ascertain whether existing binding International Law has proper instruments do deal with the legal consequences of this new emerging reality.

Therefore, this dissertation aims to address the accountability matter on the potential use of AWS between States in situations of international armed conflict (IAC) and its legal consequences.

²Solovyeva, A.; Hynek, N. “Going Beyond the “Killer Robots” Debate: Six Dilemmas Autonomous Weapon Systems Raise, *Central European Journal of International and Security Studies*, Vol. 12, No. 3, (2018), 166–208. P.194.

³Garcia, D. “Killer Robots: Why the US should Lead the Ban”, *Global Policy*, No. 6(1), (2015), 57-63. P.60.

1. Conceptual complexity

Covering different areas of knowledge, from mathematics to engineering, from neuroscience to Law and Ethics, this complex new topic brings as much excitement as contention to the table of international discussion.

Due to their complexity, most of the concepts that surround AI do not reach consensus within the international community. In this chapter we will be discussing the various approaches and definitions in order to better understand the scope of this dissertation.

1.1 Defining Artificial Intelligence

AI can be defined as a discipline whose purpose lies in the “construction of artificial entities with cognitive capacities similar to those of human beings”⁴ which develops intelligent programs that enable computer systems to think and make decisions for them – autonomous systems.⁵

Based mainly on algorithms, AI requires deep mathematical knowledge “as well as mechanisms for manipulating symbols, in order to be able to represent, modify and expand”, with more than 100 layers of learning instilled in the algorithm of these intelligent software.⁶ Also, for the development of cognitive skills in these computer systems, AI is often stimulated by the study of neurological function and promoted by neuroscience in general.⁷

Thus, when applied to field of warfare, AI can create systems capable of operating, from target identification to their elimination, without direct human intervention, something that until now it was possible only in science fiction. This is what is called

⁴Costa, E., & Simões, A. (2008). *Inteligência Artificial: Fundamentos e Aplicações* (3ª ed.). Lisboa: FCA.P.3.

⁵Rodrigues, F. “A Inteligência Artificial na Defesa Nacional”. *CEDIS Working Papers | Direito, Segurança e Democracia*, No.59, (October 2018), p.7.

⁶Shapshak, P. “Artificial Intelligence and Brain”. *Bioinformation, Research Gate*, (January 2018). Available at: https://www.researchgate.net/publication/323283173_Artificial_Intelligence_and_brain . Consultation date: September 27th 2019. Pp. 38-39.

⁷*Ibid.*

“autonomous weapon systems” (AWS). We are, therefore, one step ahead of drones, insofar as they are piloted from a distance and dependent, in their primary version, on the decisions of a human.⁸

1.2 Autonomous weapon systems

In light of the above, AWS already represent a paradigm shift, differing to a great extent from domestic computer systems as we know them. Even though computers are also previously programmed, they operate according to predefined rules and results,⁹ whereas AWS are based on genetic algorithms and therefore technologically much more advanced, endowing the machine with the ability to think and autonomy to decide what is the best way to achieve the result for which they were programmed to.

However, alongside AI, the definition of AWS has been the source of endless discussions among academics and has not yet found a consensus within the international community, being the “autonomy” element the one that raises the more divergence.¹⁰

The reason for that is related to the fact that conceptualizing autonomy requires the gathering of many areas such as robotics, engineering, computer science and, once the discussion raises several legal issues, the Law.¹¹ Indeed, autonomy can play a different role in different scenarios, understood by some as a “three dimensional concept”.¹² Thus, the concept must be interpreted differently according to the complexity of the decision-making process, the human-machine command-and-control relationship, or even the type of decisions or functions being made autonomous.¹³

⁸Seixas-Nunes, A. (2017), *Op. Cit.* P.2.

⁹*Ibid.* P.3.

¹⁰Galleoti, S. “Under the Rule of LAWS: Artificial Intelligence in Warfare”, *Security Praxis*, (April 2019). Available at: <https://securitypraxis.eu/under-the-rule-of-laws/> . Consultation date: October 8th 2019.

¹¹Boulanin, V.; Verbruggen, M. (November 2017). *Mapping the Development of Autonomy in Weapon Systems*. Stockholm International Peace Research Institute. P.5.

¹²Horowitz, M.; Scharre, P. “An Introduction to Autonomy in Weapon Systems”, *Center for a New American Security*, Project on Ethical Autonomy | Working Paper, (February 2015). Available at: https://www.files.ethz.ch/isn/188865/Ethical%20Autonomy%20Working%20Paper_021015_v02.pdf .

Consultation date: May 5th 2020. P. 5-6.

¹³*Ibid.*

Therefore, while some perspectives put the emphasis on the human involvement in the operation of AWS – we can name it the legalist perspective - some other prioritise its technical capabilities – a more technical or robotic perspective.

According to the U.S. Department of Defence 2012 Directive on Autonomy in Weapon Systems, hereinafter named DOD Directive, an AWS is a weapon that “once activated, can select and engage targets without further intervention by a human operator”.¹⁴

1.2.1 Addressing the different typologies of AWS

To address the different types of autonomy that AWS are expected to have is fundamental in order to establish clear rules that aim to protect the main purpose of International Humanitarian Law (IHL): to balance civilian protection with military gains.

Thus, from the standpoint of what we called “legalist approach”, the distinction is usually made between the human-in-the-loop, the human-on-the-loop, and the human-out-of-the-loop¹⁵ in which the focus goes to the role of the human operator in the so called OODA cycle (observe, orient, decide and act)¹⁶, or, in other words, how much involvement would the human operator have during the cycle.

Indeed, in the first case, there would be full human control during the whole OODA cycle, requiring human input at some stage of the task; in the second one, also called “human-supervised autonomous”, the system would operate autonomously while under

¹⁴Department of Defense, Washington DC (November 21, 2012) “Autonomy in Weapon Systems”, Directive Number 3000.09, Nov. 21, 2012.

¹⁵This distinction first appeared on the 2012 Report of Human Rights Watch. See International Human Rights Clinic; Human Rights Watch. “Losing Humanity: The Case Against Killer Robots - Report”, *Human Rights Watch*, (November 19th 2012). Available at: <https://www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots> . Consultation date: October 23rd 2019.

¹⁶The OODA (observe, orient, decide and act) cycle was first developed by John Boyd, an American military strategist, to evaluate operational combat decision processes. In, Pereira, M. (2017). *Op. Cit.*, pp. 299-300.

the supervision of a human operator that can intervene if something goes wrong; and in the last one, the system would be able to act and decide without human intervention.¹⁷

A more technical perspective on autonomy, in turn, differentiates between automatic weapon system, automated or semi-autonomous weapon system and autonomous systems. This approach emphasises the self-governance ability of the machine to deal with uncertainties in its operating environment.¹⁸

Automatic systems are previously programmed systems in which it is necessary to enter certain data so that they respond as they are programmed to. Examples of such systems are small guns, which fire after the trigger is pressed, or anti-personnel mines that explode when pressed with the weight of a person, as previously programmed to do so.¹⁹

Yet, the distinction between automated and autonomous system is highly debated and some authors do not recognize a major difference between the two concepts, seeing the second one as a more complex form of the first.

Other authors such as ANDREW WILLIAMS²⁰ state that autonomous systems are able of understanding intent and direction from the perception of its involving environment. Thus, “it is capable of deciding a course of action, from a number of alternatives, without depending on human oversight and control, although these may still be present. Although the overall activity of an autonomous unmanned aircraft will be predictable, individual actions may not be”.²¹

MARIA PEREIRA²² also presents a distinction between the two concepts. According to this author, semi-autonomous weapon systems differ from the automatic ones in that they are able to autonomously define the necessary parameters, such as data analysis and observation. This means that semi-autonomous weapon systems have two

¹⁷Garcia, E. V. “Inteligência Artificial, Paz e Segurança: Desafios para o Direito Internacional Humanitário”, *Instituto de Pesquisa de Relações Internacionais (IPRI) Brasília, Cadernos de Política Exterior*, No. 8, (2019), 1-15, p. 4.

¹⁸Boulanin, V.; Verbruggen, M. “*Mapping the Development...*”, *Op. Cit.*, p. 6.

¹⁹Pereira, M. (2017). *Op. Cit.*, pp. 299-300.

²⁰Williams, A. (2015) – “Defining autonomy in systems: challenges and solutions” – *On Williams, A.; Scharre, P. (org.) (2015) Autonomous Systems: Issues for Defence Policymakers*. Norfolk, Virginia: NATO Communications and Information Agency. Pp. 33-34.

²¹ *Ibid.*

²²Pereira, M. (2017). *Op. Cit.*, pp. 299-300.

particularities: once activated, it will only engage targets that have been previously selected by a human operator²³. Moreover, before acting, a human agent is consulted to decide whether the action will be carried out or not.

This means semi-autonomous weapons are able to independently track and identify potential targets as well as prioritizing them or to make recommendations on when would be the best timing to fire.²⁴ An example of these systems would be the South Korean sentinel robots²⁵, the SGR-A1, that patrol the frontier between South and North Korea. This system uses infrared lens to recognize targets²⁶ and has the capacity to “identify, track and shoot targets, although the latter phase currently requires human authorization”. Thus, this system is able to switch from automated to autonomous, fitting in the concept of “sliding autonomy”²⁷.

Another example is the Israeli antimissile “Iron Dome”. This system was developed to detect and to counter short range rockets while a control centre coordinates the response. The system is programmed to calculate where the rockets would fall, triggering the interceptor if the predicted trajectory falls in a populated area and ignoring it otherwise.²⁸

Finally, the most complex and those that raise the most legal issues are the autonomous systems. From the moment they are programmed, these have the ability to observe and collect data as well as to analyze them, define procedures and act according to defined procedures without needing any human assistance.

Even though there are no known “fully” AWS in the sense of robots with human-level cognitive capabilities, completely independent from human control (and for

²³Department of Defence, Washington DC (November 21, 2012) “Autonomy in Weapon Systems”, Directive Number 3000.09, Nov. 21, 2012.

²⁴Pereira, M. (2017), *Op. Cit.*, pp. 299-300.

²⁵*Ibid.*

²⁶*Ibid.*

²⁷Boulanin, V.; Verbruggen, M. “Mapping the Development...”, *Op. Cit.*, p. 6.

²⁸Correia, A. “Como funciona a “Cúpula de Ferro”, o sistema israelita que interceta mísseis no ar”, JN, (May 6th 2019). Available at: <https://www.jn.pt/mundo/como-funciona-a-cupula-de-ferro-o-sistema-israelita-que-interceta-misseis-no-ar-10866232.html> . Consultation date: April 29th 2019.

security reasons, is not even expected), if the weapon has the capability to independently select and engage targets, then we are in the presence of a fully AWS.²⁹

An existing/current example is the U.S. Navy's Phalanx CIWS. This Aegis control system, operated in conjunction with Phalanx Close in Weapons System, is a defence system against anti-ship missiles, surface mines and aircraft. It has the ability to search, detect, track and evaluate independently. It also has engagement and kill-assessment functions.³⁰

Another example is encapsulated by the torpedo mines, nowadays used by China and Russia, known as the PMK-2. Unlike a classic extremely simple device mine, these torpedo mines are able to independently select and engage targets on its own whereas a classic mine is fixed and at least the mined area is known. Therefore, these system are activated by a passing ship and, instead of exploding, it opens a capsule, releases a torpedo and engages the target. Thus, the created torpedo is not used to engage a previously selected target by a human agent neither is simply blowing up in a place.³¹

However, regardless of the perspective one adopts, autonomy will always be integrated by three capabilities: sense, decide and act.³² Therefore, in a first phase the system perceives the environment through inherent sensors that collect and interpret information (data) – “sense”- afterwards, those data will serve as input for the decision process which, in turn, will be determined by the control system and how it was programmed. And ultimately, the result of the decision process will be exerted to the physical world.³³

²⁹Crootof, R. “War Torts: Accountability for Autonomous Weapons”, *University of Pennsylvania Law Review*, Vol.164, No.6, (2016), 1347-1402, pp. 1368-1369.

³⁰General Dynamics, Ordnance and Tactical Systems. “Phalanx CIWS. Close-In Weapon System (CIWS)”, General Dynamics, Ordnance and Tactical Systems, Naval Platform Systems. Available at: <https://www.gd-ots.com/armaments/naval-platforms-system/phalanx/>. Consultation date: May 5th 2020.

³¹Scharre, P. “Autonomous Weapons and Operational Risk”, *Center for New American Security*, Working Paper, (February 2016). Available at: https://s3.amazonaws.com/files.cnas.org/documents/CNAS_Autonomous-weapons-operational-risk.pdf. Consultation date: March 30th 2020, pp. 14-15.

³²US Department of Defense (DOD), Office of Technical Intelligence, Office of the Assistant Secretary of Defense for Research and Engineering, *Technical Assessment: Autonomy* (DOD: Washington, DC, Feb. 2015), p. 2.

³³ Boulainin, V.; Verbruggen, M. “*Mapping the Development...*”, *Op. Cit.*, pp. 7-9.

But regardless of the nature of each one of the perspectives described above, as stated by KERSTIN VIGNARD³⁴, “ultimately the autonomy question is really about what control/oversight do we expect humans to maintain over the tools of violence that we employ”. Based on this premise and allied to the lack of consensus in defining “autonomy”, the international discussion switch its focus to discussing the level and range of desired “meaningful human control”.³⁵

2. AI in warfare: Challenges posed to International Law

Although some authors deny it is as a reality, AI technology applied to autonomous systems has been described as the third revolution in warfare, after gunpowder and nuclear arms³⁶, raising many concerns, including legal and ethical. Thus, it is not a question of ‘*if*’ but *when*.

In fact, states like the USA and the UK have already set themselves the goal to achieve full autonomy in AWS and others like China and Russia, although they have not clearly assumed this purpose, it is known that efforts are being made in the same direction.³⁷ Regarding this subject, Vladimir Putin has even stated that “whoever becomes the leader in this sphere will become the ruler of the world”.³⁸

In view of the above, the development of autonomous weapon systems has posed complex security challenges for the future of humanity³⁹ and International Law. From

³⁴Vignard, K. Statement of the UN Institute for Disarmament Research at the CCW Informal Meeting of Experts on Lethal Autonomous Weapon Systems, (April 12th, 2016). Available at: <https://www.unidir.org/files/medias/pdfs/unidir-s-statement-to-the-ccw-informal-meeting-of-experts-on-lethal-autonomous-weapon-systems-eng-0-648.pdf> . Consultation date: May 1st 2020.

³⁵See. Report of the 2019 session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems, Geneva, 25–29 March 2019 and 20-21 August 2019.

³⁶Guiora, Amos N. “Accountability and Decision Making in Autonomous Warfare: Who is Responsible?”. *Utah Law Review*, Vol. 2017, No.2, Article 4 (2017), p. 2.

³⁷Pereira, M. (2017) “E se é o robot quem decide matar? Alguns problemas jurídicos dos sistemas de armamento autónomos.” In *O alcance dos Direitos Humanos nos Estados Lusófonos*. Santa Cruz do Sul: EDUNISC, 298-312, p. 298.

³⁸The Economist. (January 27th 2018) *The next war: the growing danger of great-power conflict*. London: The Economist, Special Report.

³⁹Pandya, J. “The weaponization of Artificial Intelligence”, *Forbes*, (February 14th 2019). Available at: <https://www.forbes.com/sites/cognitiveworld/2019/01/14/the-weaponization-of-artificial-intelligence/#416323d73686> Consultation date: October 1st 2019.

the point of view of the legality of the AWS *per se*, questions arise whether it complies with the *jus in bello*, namely, with the principle of proportionality and distinction established as principles of International Humanitarian Law (IHL). In addition, doubts remain regarding accountability for a crime committed through a weapon system in which no human agent engaged directly.

In particular, in order to legally accommodate weapons with the ability to target, select and engage independently might demand the (de)construction of classic legal concepts such as *mens rea* and “effective control”. In any case, it is imperative to ensure the attribution of responsibility for illegitimate actions carried out through AWS before they take place in the battlefield.

However, there is no consensus within the international community on how should AWS be addressed – regulation or total ban; this point will be covered in the next heading.

2.1 Regulation versus Total Ban of AWS

The total prohibition of the use of AWS systems may contribute to technological stagnation, but their proliferation may pose great risks to the security of both military personnel and civilians if their employment happens without strict regulation. Although it is too early to know the results of the development of Artificial Intelligence, some of these inventions already raise ethical and legal questions, even at the stage of development.

In 2009, Noel Sharkey, an AI professor at the University of Sheffield, warned about the possibility of introducing autonomous weapon systems in a warfare context.⁴⁰ Since then, some experts have advocated for a total ban on the development and application of artificial intelligence techniques to weapon systems.⁴¹

⁴⁰Seixas-Nunes, A. (2018) “Autonomous Weapon Systems: compatible with International Humanitarian Law?”, in *Direito Internacional e o Uso da Força no Século XXI*. Lisboa: AAFDL editor, 479-500, p. 487.

⁴¹For instances, in 2013 a wave of advocates for the ban on the development and use of autonomous systems arises, with ONG’s such as Human Rights Watch, Article 36, International Red Cross and International Amnesty, as well as some states such as Bolivia, the Holy See, Peru, Pakistan, among others. In Seixas-Nunes, A. (2017) *Op. Cit.*, p. 3.

Others yet advocate regulation rather than a ban.

In this context, we should note that the most recent gun ban took place in 1997, in Ottawa, in the Convention on the Prohibition of the Use, Storage, Production and Transfer of Antipersonnel Mines and on their Destruction.

In 2013, the CCW Meeting of State Parties⁴², which aims to regulate weapons that can be considered excessively harmful or indiscriminate, decided that in the years that followed, governmental experts would hold informal Meetings to discuss the questions related to emerging technologies in the area of lethal autonomous weapons systems (LAWS).⁴³

Only in 2016, during the Fifth Review Conference of the High Contracting Parties to the Convention on CCW, a Group of Governmental Experts (GEE) was established as an open-ended group on emerging technologies in the area of lethal autonomous weapons systems.

During all of their meetings until 2019, many discussions having been carried out on the use of some systems of selective autonomy and the need for establishing minimum levels of human control but to date, there is no consensus among the international community neither on the hypothetical use of these systems in a war-like context nor the procedures for this weaponry legal review.

While some authors argue “the troubling nature of autonomous warfare is manifested by the clear desire to minimize human involvement in its application”,⁴⁴ others manifest strong concerns regarding the lack of compliance with moral reasons. For instance, U.N. Secretary-General António Guterres stated that AWS “are politically unacceptable, are morally repugnant, and should be banned by international law”.⁴⁵ But

⁴²Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects.

⁴³The term “LAWS” has been adopted within the GEE meetings. In opposition to the term AWS, some authors criticize the adopted term is a misleading construct and carries a highly political baggage. In Trumbull IV, C. “Autonomous Weapons: How Existing Law Can Regulate Future Weapons”, *Emory International Law Review*, Vol.34, (2020), 533-594, p. 538.

⁴⁴Guiora, Amos N. *Op. Cit.*, p. 27.

⁴⁵António Guterres, U.N. Secretary General, Remark at the Lisbon Web Summit 2018. Available at: <https://www.un.org/press/en/2018/sgsm19332.doc.htm> . Consultation date: May 23rd 2020.

although the importance of considering moral reasons should not be undermined, this dissertation will focus only on legal evaluations in order to judge this matter.

Interestingly, it has been pointed that there are some potential humanitarian benefits in the use of AWS. It is believed that AI technology could enable these systems to have higher precision, accuracy and speed⁴⁶ and thus making AWS more discriminate than other weapons, reducing the risk to civilians.⁴⁷

Thereby, even though autonomy represents, without a question, the core characteristic of AWS we do believe it is not the autonomy characteristic that *by itself* represents a “troubling nature” but the lack of objective standard regarding weapon legal reviews and the lack of clear regulation in order to ensure accountability. Instead, discussions on the legitimacy of AWS would be more productive if it there were less focus on conceptualizing autonomy and instead, ascertaining whether those capabilities would behave in accordance with IHL standards in an operational battlefield environment.⁴⁸

Thus, when discussing the possibility of a ban to the research, development and deployment of AWS some authors argue that, as AWS are also being developed by the private sector, a ban would be difficult to enforce⁴⁹ and even counter-productive as it is very unlikely to deter States from acquiring these weapons, since a clear assumption in this direction was already publically stated.⁵⁰

We do defend the premise that technological evolution should take its course; however, the parameters in which it happens and how it happens should be regulated and controlled. It has become imperative to propose and discuss a legal framework that takes into account ethical and moral aspects, without however interfering with technological

⁴⁶Pandya, J. *Op. Cit.*

⁴⁷Trumbull IV, C. *Op. Cit.*, p. 557.

⁴⁸Anderson, K.; Waxman, M. “Law and Ethics for Autonomous Weapon Systems: why a ban won’t work and how the laws of war can”, in *Stanford University, The Hoover Institution (Jean Perkins Task Force on National Security and Law Essay Series)*, (2013) Available at: http://media.hoover.org/sites/default/files/documents/AndersonWaxman_LawAndEthics_r2_FINAL.pdf . Consultation date: May 26th 2019, p. 19.

⁴⁹Trumbull IV, C. *Op. Cit.*, p. 535.

⁵⁰ See. Note 37.

progress. And the same can be said about legal control over AWS legitimacy, safety and accountability before it takes place in the battlefield.

Ultimately, we must consider whether the existing legal framework is sufficient to accommodate this complex new reality,⁵¹ taking into account the several disciplines involved in regulating this matter; this will be covered in the next chapter.

3. Relevant Legal Framework

When addressing the use of AWS in warfare, several legal disciplines are involved in regulating this matter. This chapter will make a brief reference to the different roles and purposes of the *Jus ad bellum*, *Jus in Bello*, and Human Rights and International Criminal Law in order to clearly establish who can be held accountable/ should have responsibility for AWS unlawful acts which will be discussed in chapters 5 and 6.

3.1. *Jus ad bellum*

Jus ad bellum or the Use of Force appears as a response to the discretionary use of force by States. After failing to achieve its purpose to preserve international peace, the Covenant of the League of Nations (LoN) gives rise to the entry into force of the Charter of the UN, hereinafter, The Charter, after WW II.⁵²

Setting the goal to create an efficient system that enforces international peace by restricting the use of force between States⁵³, the Charter established what is recognized today as a *jus cogens* norm, i.e., a mandatory norm of general International Law⁵⁴ (IL): the prohibition of the use of force. Indeed, article 2.º/4 established that “all Members

⁵¹Brehm, M. “Defending the Boundary. Constraints and Requirements on the Use of Autonomous Weapon Systems Under International Humanitarian and Human Rights Law”, *The Geneva Academy of International Humanitarian Law and Human Rights*, Academy Briefing No.9, (May 2017), 1-73, p. 10.

⁵²Lopes, A. (2020) – “Uso da Força e Direito Internacional”, in Lopes, José Alberto Azeredo (coordenador) (2020) – *Regimes Jurídicos Internacionais*. Vol.1, 1ª ed., Porto: Universidade Católica Editora, p. 9-14.

⁵³CICV. “ODIH e outros regimes legais – jus ad bellum e jus in bello”, *Comité Internacional da Cruz Vermelha*, (October 29th 2010). Available at: <https://www.icrc.org/pt/doc/war-and-law/ihl-other-legal-regimes/jus-in-bello-jus-ad-bellum/overview-jus-ad-bellum-jus-in-bello.htm> . Consultation date: April 24th 2020.

⁵⁴Lopes, A. (2020) – “Uso da Força ...” *Op. Cit.*, p. 14.

shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations”.

The established prohibition is directed, in the foreground, to the member States on the international plan, in order to protect States sovereignty and avoid interference in the State’s internal affairs.⁵⁵ However, the prohibition established by the provisions is equally binding on all States and International Organizations (IO), given its customary value, leaving only aside non-state actors such as terrorist organizations.⁵⁶

On a different note, this provision relates to both the prohibition of the threat of the use of force and also the use of force itself noting that the concept of “force” is much broader than the concept of “war” used in previous legal instruments as in the Covenant of the LoN and in the 1928 Briand-Kellogg Pact.⁵⁷

3.2. *Jus in Bello* and International Human Rights Law

While *Jus ad bellum* aims to regulate the legitimacy of the use of force, International Humanitarian Law (IHL) intends to limit the effects of an armed conflict without prior judgments as to its origins.⁵⁸ Thus, IHL primary purpose is to regulate the conduct of hostilities and, in the face of that reality, “*refuse indifference*” as stated by MARIA ISABEL TAVARES.⁵⁹

Similarly, as the *Jus in Bello*, IHRL has a relevant role when ascertaining the legality of a new weapon in the battlefield. Namely, both aim to protect human life and dignity. However, while IHRL presupposes a situation of peace in order to fully maximize the realization of human rights, IHL requires the existence of a conflict in order to be applied.⁶⁰

⁵⁵Lopes, A. (2020) – “Uso da Força ...” *Op. Cit.*, p. 35-36.

⁵⁶*Ibid.* P. 28-29.

⁵⁷*Ibid.* P. 29-31.

⁵⁸Tavares, M. (2020) – “Direito Internacional Humanitário”, in Lopes, José Alberto Azeredo (coordenador) (2020) – *Regimes Jurídicos Internacionais*. Vol.1, 1ª ed., Porto: Universidade Católica Editora. pp. 221-222.

⁵⁹*Ibid.* P.220.

⁶⁰*Ibid.* P. 223-224.

In the face of the above, armed conflicts, internal and international, are intensively regulated by scattered international legal instruments. However, the main legal instruments of IHL are enshrined in the Geneva Conventions of 1949 and by the two Additional Protocols of 1977, all of which have been widely ratified.⁶¹

As a cornerstone of the Law in the regulation of armed conflicts, IHL and in particular, pursuant to the Martens Clause, set out in Article 1^o/2 of the Additional Protocol I to the Geneva Conventions⁶², hereinafter Additional Protocol I (AP I), both the conduct of hostilities and the use of new weapons must be subordinated to the general principles of international law, which will be covered in chapter 4.

3.3. International Criminal Law

Lastly, the problem of AWS also involves International Criminal Law (ICL). When ascertaining the possibility of war crimes, crimes against humanity or genocide being carried through AWS, criminal liability would arise under the jurisdiction of the International Criminal Court (ICC), circumstance we will analyse further in chapter 5.

Moreover, in addition to the above mentioned crimes, as of July 17th 2018, the ICC has jurisdiction over the crime of aggression, which has been ratified 39 State Parties, including Portugal. Yet, while the above mentioned crimes imply serious violations of IHL, the crime of aggression represents a violation of the rules of the *Jus ad bellum*⁶³.

Indeed, the rapid technological evolution is one of the major elements of tension between the Law and social reality⁶⁴ raising the question whether a crime committed through AWS or, for instance, a cybercrime, could be considered a crime of aggression. However, not neglecting the relevance of this quarrel, this issue is outside the scope of this paper.

⁶¹The Geneva Conventions have been ratified by 196 State-Parties while AP I as been ratified by 174 and AP II by 168 States. In, Tavares, M. (2020) – “Direito Internacional Humanitário” *Op. Cit.* Pp. 214-215

⁶²Being the complete designation “Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of the Victims of International Armed Conflicts (Protocol I), of June 1977”.

⁶³Tavares, M. (2020) – “Direito Internacional Humanitário”. *Op. Cit.* P.268.

⁶⁴Lopes, A. (2020) – “Uso da Força ...” *Op. Cit.*, p. 209.

4. Ascertaining the legality of AWS under IHL

The role of IHL is to limit the right of the parties to freely choose the methods and means used in war for humanitarian reasons, it can be easily understood that this rules must not be ignored in the presence of new weapons⁶⁵.

As such, this chapter explores whether AWS can be considered categorically prohibited under IHL.

4.1. Martens Clause

First introduced in the 1899 preamble to Hague Convention II on the Laws and Customs of War and Land, and later on introduced in the Additional Protocol I of 1977, the martens clause states that “in cases not covered by the law in force, the human person remains under the protection of the principles of humanity and the dictates of the public conscience”.

As such, the clause creates a legal obligation for States to consider moral implication in the development or adoption of a new weapon by requiring compliance with principles of humanity and dictates of public conscience. Therefore, the first question that rises is whether AWS are able to comply with these principles.

For the Arms Control Association, who advocates for a total ban of the AWS, the answer would be undoubtedly no. It is said that fully autonomous weapons, would not be able to comply with these principles since it requires “humane treatment of others and respect for human life and dignity”.⁶⁶ This argument is grounded on the idea that the decision to shoot at a target or not would be based on the use of algorithms and thus would fail to respect human dignity.⁶⁷

⁶⁵Pereira, M. (2014) *Noções Fundamentais de Direito Internacional Humanitário*, Coimbra: Coimbra Editora, p. 3.

⁶⁶Docherty, B. “REMARKS: Banning ‘Killer Robots’: The Legal Obligations of the Martens Clause”, *Arms Control Association*, (October 2018). Available at: <https://www.armscontrol.org/act/2018-10/features/remarks-banning-‘killer-robots’-legal-obligations-martens-clause>. Consultation date: January 23rd, 2020.

⁶⁷*Ibid.*

Likewise, Human Rights Watch decries AWS would lack both legal and ethical judgment which ultimately gives “people the means to minimize harm”.⁶⁸

Interestingly, on the same subject, JOSHUA HUGHES⁶⁹ takes a completely opposite position by underlining the need to make a strict distinction between legal concepts and moral or ethical ones when addressing the concepts of “principles of humanity” and “dictates of public conscience”. And the real importance of doing so, the author stresses, lies on its effects - “while compassion provides a motivation to act humanely, legal and ethical judgment provides a means to do so”.⁷⁰

In any case, in order to be considered lawful under International Law, AWS must prove to be able to comply with the laws of war, which will be discussed at the end of this chapter.

4.2. Principles of International Humanitarian Law

The importance to ascertain whether the use of AWS is legitimate under International Law and International Humanitarian Law is intimately related with its ability to comply with the principles of distinction and proportionality, ruled by the International Court of Justice (ICJ) as the cardinal principles of IHL.⁷¹

Therefore, what we intend to ascertain is whether given the particularities of AWS, these would be able to comply with the rules and principles of International Law.

A. Principle of Proportionality

⁶⁸Docherty, B.; Human Rights Watch “Heed the Call - A Moral and Legal Imperative to Ban Killer Robots”, *Human Rights Watch*, (August 2018). Available at: <https://www.hrw.org/report/2018/08/21/heed-call/moral-and-legal-imperative-ban-killer-robots>. Consultation date: January 23th 2020.

⁶⁹Hughes, J. “No, autonomous weapon systems are not unlawful under the Martens Clause”, *Media Corporation*, (August 2018). Available at: <https://medium.com/@jghughes1991/no-autonomous-weapon-systems-are-not-unlawful-under-the-martens-clause-2653d18790e9>. Consultation date: February 2nd 2020.

⁷⁰*Ibid.*

⁷¹ICJ Report, July 8th 1996, parag. 78 – Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons.

As a cardinal principal in the conduct of hostilities, the principle of proportionality is regulated in several international instruments, namely, in the Additional Protocols (AP) I and II and in the Rome Statute.

The principle of proportionality establishes that in the conduct of hostilities during an armed conflict, parties to the conflict must not launch an attack whenever the damage is expected to be excessive in view of the anticipated military advantage.⁷² Pursuant to the Rome Statute⁷³, “intentionally launching an attack in the knowledge that such attack will cause incidental loss of life or injury to civilians or damage to civilian objects or widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated” constitutes a war crime under international armed conflicts (IAC).

Thus, in order to comply with this principle, AWS would have to be able to analyze a plurality of factors and, in a complex and unpredictable scenario, evaluate a situation in which surprise factors will inevitably arise.

Although these will always be context-dependent assessments, it has to be safely guaranteed that these systems are designed to efficiently anticipate several scenarios in order to comply with the principle of proportionality.

B. Principle of Distinction

The principle of distinction, laid down in article 48.^o of AP I, requires that a distinction be made between combatants and civilians and between civilian and military assets. Consequently, indiscriminate methods of attack are prohibited under IHL.

In this sense, pursuant to article 51.^o/4 of AP I, the means and methods employed in an attack have to be directed at a specific military object, under penalty of

⁷²Pursuant to article 51.^o/5/b) of Additional Protocol I, “an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated”.

⁷³Art.8.^o/1 and art.8.^o/2/b)/iv of the Rome Statute.

unlawful action under the terms of IHL. Moreover, the lawful use of AWS also depends on the compliance with AP I regarding the prohibition against certain kinds of attacks, namely, those who aim at objects considered indispensable for the survival of civilian population, the natural environment and installations containing dangerous forces respectively, as established in articles 54.^o *et seq.*, of AP I.

Thus, this principle requires for an AWS to have the capability of not only distinguishing between legitimate and non-legitimate targets, but also, to carry the attack in a discriminatory manner.⁷⁴

4.2.1 Preliminary conclusions: can AWS be considered categorically prohibited under IHL?

In view of the above, we can find three common arguments against AWS compliance with IHL. First, an autonomous system would fail to comply with IHL principles by not being endowed with emotions. Second, AWS would lack legal and ethical judgment to act in accordance with international rules. And lastly, this system would fail in complex situations.

i. An autonomous system would fail to comply with IHL principles by not being endowed with emotions.

Autonomous systems would, in fact, lack the ability to have emotions and therefore, its decisions would not be made under compassionate reasons.

Nevertheless, even though compassion is, in fact, an inherent capacity of human beings and undeniably useful in some circumstances, that does not mean it is useful in the majority of them. In fact, the ability to feel compassionate for others can be a way of blurring human reasoning and consequently make ineffective decisions from the military advantage standpoint.

⁷⁴*Ibid.*

Indeed, the particularity of not being endowed with emotions may guarantee that an autonomous system could make proper judgement of the proportionality of an attack, considering its consequences without being motivated by fear or resentment.

However, in order to comply with the principle of distinction, several variables would have to be foreseen and previously determined into AWS. For instance, which kind of weapon should be used so that military advantage is gained while the amount of damage created is not excessive, or how many casualties would be acceptable. Furthermore, the system will have to be programmed in such a way that it will decide what might be excessive in each circumstance.⁷⁵

If, on the one hand it seems to us premature to conclude the impossibility to insert an algorithm capable of meeting all the mentioned variables, on the other hand, we wonder if it is humanly possible to previously determine all these scenarios. Thus, the issue is not if autonomous weapon would be able to comply with how it was programmed to behave but rather if it is humanly possible to foresee all these variables. In any case, the main problem is not whether these machines would be as fallible as a human agent in the same situation, rather on whom would the responsibility fall in case it does fail.

Similarly, regarding compliance with the requirements imposed by the principle of distinction, some authors argue that autonomous systems, by not being endowed with emotions, would be able to assess, in a more effective and more objective way, which targets to hit.⁷⁶ Moreover, autonomous systems are capable of holding a big amount of data which could entail a great advantage in order to comply with the principle of distinction.

In order to understand the scope of this advantage let's consider a terrorist attack. While it represents one of the biggest challenges posed to the security of humanity, a terrorist would look exactly like a civilian. It might act in a way that would suggest his intention, or it might not. What we know for certain is that it will not wear any clear symbol of a military combatant as his intention is, wittingly, to be confused with a

⁷⁵Wagner, M. "Taking Humans Out of the Loop: Implications for International Humanitarian Law". *Journal of Law, Information and Science. Miami Law Research Papers Series*. (July 2011). Available at: <http://www.austlii.edu.au/au/journals/JILawInfoSci/2012/9.html> . Consultation date: October 10th 2019, p. 8.

⁷⁶Pereira, M. (2017). *Op. Cit.*, p. 305.

civilian. In such case, there is a need to identify and eliminate the target in accordance with the principle at issue.

While this may pose a herculean assignment for a human agent, whose success would be more dependent on his experience in the battlefield rather than a technical aspect, posing great difficulty, an AWS could rely on unlimited information available in the virtual world,⁷⁷ with relative ease. As AFONSO SEIXAS NUNES⁷⁸ underlines, “if we take into account the information available in social media, it will be easy to conclude that an autonomous system can quickly establish patterns of life, conduct and location for millions of individuals at the same time”.

In that case, defending or not the use of AWS in warfare context, intelligent systems would hold an unquestionably advantage when compared to human agents in compliance with the principle of distinction, by having an ability beyond humane to search and storage millions of information regarding different people, in a matter of seconds.

However, it must be assured that AWS would be able to perform in accordance with these capabilities both in an abstract way⁷⁹ as in a battlefield context knowing that, pursuant to articles 50.º/1 and 52.º/3 of AP I, when in doubt, the presumption must be that the target is not legitimate.⁸⁰

Therefore, it seems for us clear that so far, we cannot state that the use of an AWS or even the weapon per se is unlawful under IHL. Yet, one thing is certain: if the AWS is not equipped with the ability to assess the proportionality of the attack it intends to carry out and to proper distinct legitimate and illegitimate targets, its use will not be lawful under international humanitarian law.

ii. AWS would lack legal and ethical judgment to act in accordance with international rules.

⁷⁷Seixas-Nunes, A. (2017). *Op. Cit.* P. 3.

⁷⁸*Ibid.*

⁷⁹Wagner, M. (2014), *Op. Cit.*, p. 1391.

⁸⁰*Ibid.*

Regarding the second argument, it seems to be related with the first one: AWS won't be capable to comply with the laws of war because it lacks legal judgement. However, as technology advances, this argument seems to be even more fragile than the first one.

As stated by SIMON CHESTERMAN⁸¹, while humans must be trained, AWS could have these rules internalized in its system and act in compliance with them without fatigue, fear or anger to get in the way. Therefore, it is possible and highly likely that AWS not only would be able to comply with laws of war, but actually can be programmed to be more capable of compliance than humans.

iii. AWS would fail in complex situations.

Regarding the last argument that autonomous systems would fail in complex situations we are forced to partially agree. Indeed, AWS cannot be programmed so perfectly to act accordingly in unpredictable situations. However, neither could a human agent.

As such, this appears to be a weak argument against AWS in a warfare context as the real concern behind it, once again, it is not really the ability of these systems to act in accordance with legal parameters in limitless scenarios, but instead, if the operator would be able to predict and program them in advance.⁸² Therefore, the real issue on this topic is, whereas a human could be held accountable for an unlawful act pursuant to International Law the same cannot be said so clearly about a system who would act without direct human input.

In conclusion, AWS do not appear to be, as such, unlawful under the rules of IHL. However, it remains to be ascertained whether the regulation of weapons legal reviews as currently in force are sufficient in order to ensure AWS compliance with IL.

⁸¹Chesterman, S. "Artificial Intelligence and the problem of autonomy". *Notre Dame Journal on Emerging Technologies*. Vol.1 (2020), p. 23.

⁸²*Ibid.*

4.3. The obligation of weapons review: particular challenges

In compliance with article 36.^o of Additional Protocol I⁸³, it is the responsibility of the State that intends to adopt a new weapon to certify its legality under IHL requirements.

Thus, the new weapon must comply with the two substantive rules in this article: first, it should not cause unnecessary suffering or superfluous injuries⁸⁴ and secondly, the rule against inherently indiscriminate weapons, pursuant to article 54.^o of the I Additional Protocol. Thus, it is understood that a weapon is, by its nature, indiscriminate when it cannot be aimed at a specific target, being highly likely to strike both civilians and combatants⁸⁵.

But the fact that an AWS takes the final decision, although this may pose an ethical question, it does not appear to violate, in itself, the provisions by IHL as long as it is possible to provide enough information to the device to guarantee that the attack will be aimed at a legitimate target.⁸⁶ Therefore, a State has the obligation to ensure the autonomous system has all the needed capabilities to perform in accordance with IHL.

However, several problems arise with the application of this article. Namely, even though this obligation is well established, the corresponding certification is done by each State. The current interpretation of article 36.^o enables each State to freely choose the means and methods to certify the legality of a particular weapon⁸⁷, which may not offer global certainty as these procedures are confidential. Besides that, it does not contemplate ethical requirements.⁸⁸

Moreover, with the rapid pace these technologies are evolving it is becoming clear that unlike other weapons, the design of AWS will rapidly evolve to systems that are

⁸³“In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party”.

⁸⁴Pursuant to article 35.^o/2 of AP I “ it is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering”.

⁸⁵Anderson, K.; Waxman, M. *Op. Cit.*, p. 10.

⁸⁶*Ibid*, pp. 11-12.

⁸⁷*Ibid*, p. 4.

⁸⁸Garcia, E. V. *Op. Cit.*, p. 7.

capable of learning online or during their deployment – this is what the scientific community calls as “machine learning”.⁸⁹

As these systems may be constantly re-parameterizing and reprogramming themselves, an important question arise as to know when these internal modifications would require a new legal review. And to simply wait for a clear change in its behaviour to occur would not be safe.

Thus, AWS may require constant testing and evaluation which demands the implementation of new methodologies. Foreseeing this issue, the United States, for instance, are already conducting development of a new method of continuous testing and evaluation by programming the systems to report its learning and modifications.⁹⁰

Ultimately, this continuous testing would foresee behaviours that might not be legal under IL forcing the relevant State to stop reckless acts. Whatever method is chosen it will have to guarantee its safety for use in warfare context, and assuming responsibility for its continuous legality under both international norms and principles.

In conclusion, although these systems do not appear to be illegal *per se* under IHL, the most pressing issue noted in this chapter relates to the uncertainty regarding accountability for illegal actions carried out through autonomous weapon systems.

5. General remarks on accountability

⁸⁹Boulanin, V.; Verbruggen, M. “Article 36 Reviews: Dealing with the Challenges posed by emerging new technologies”, *Stockholm International Peace Research Institute*, (December 2017). Available at: https://www.sipri.org/sites/default/files/2017-12/article_36_report_1712.pdf. Consultation date: February 26th 2020, pp. 24-25.

⁹⁰Boulanin, V.; Verbruggen, M. “Article 36 Reviews...”. *Op. Cit.*, pp. 24-25.

“There can be no justice in war if there are not, ultimately, responsible men and women.”⁹¹

Ensuring accountability is not only important by itself but also because allowing for impunity would bring serious consequences for international peace.⁹² If no link between Law and Moral is ensured, war as we know it would be conducted without rules or limits and therefore, without respect for both human dignity and life.

When addressing the possibility of integrating a weapon system with the capability of operating autonomously in the battlefield, we must not ignore the fact that not only it *might* commit war crimes but, at some given point, *inevitably* will. However, while it is materially possible for AWS to commit acts amounting to war crimes or crimes against humanity, by lacking moral agency, these systems could not be held responsible as the direct agent of the unlawful conduct.⁹³

Thus, having explained about the unlikely possibility of AWS being considered categorically prohibited, on the next heading we will address the elements of international accountability under the rules of ICL, namely, the legality principle and the *mens rea*, as a mechanism of International Humanitarian Law enforcement.

5.1. Elements of international criminal responsibility

A. Legality Principle

As in any legal matter, the ground to hold someone accountable for his unlawful act or acts is based on the legality principle. Thus, ICL predicts accountability for any

⁹¹Walzer, M. (1979). *Just and Unjust Wars: A Moral Argument with Historical Illustrations*. New York: Basic Books, pp. 287-288.

⁹²Kirsch, P. (President of the International Criminal Court). “Applying the Principles of Nuremberg in the ICC. Keynote Address at the Conference “Judgment at Nuremberg” held on the 60th Anniversary of the Nuremberg Judgment”. International Criminal Court, (September 30th2006) Available at: https://www.icc-cpi.int/NR/rdonlyres/ED2F5177-9F9B-4D66-9386-5C5BF45D052C/146323/PK_20060930_English.pdf . Consultation date: March 1st 2020.

⁹³Amoroso, D.; Tamburrini, G. “The ethical and legal case against autonomy in weapons systems”, *Global Jurist*, (2017). Available at: <https://www.degruyter.com/view/journals/gj/18/1/article-20170012.xml> . Consultation date: March 23th 2020, p. 15.

unlawful behaviour, regardless of the agent who committed it, as long as it constitutes a criminal offense under national or international law.

In international law this principle is stated in articles 22.^o and 23.^o of the Rome Statute and are represented, respectively, by the Latin maxims *nullum crimen sine lege* (NCSL) and *nulla poena sine lege*.

Translated to “no crime without law” and “no punishment without law”, these principles establish that no one shall face criminal punishment for an act that was not criminalized by law at the time it was committed.⁹⁴ Aiming to ensure the legal certainty principle and to protect human rights, NCSL are also embodied in article 11. ^o, number 2, of the Universal Declaration of Human Rights (UDHR)⁹⁵ which states that "no one shall be held guilty of any penal offense on account of any act or omission which did not constitute a penal offense, under national or international law, at the time it was committed."

Likewise, under the ICRC Rule 156 established as customary international law applicable in international and non-international armed conflicts, “serious violations of international humanitarian law constitute war crimes”. By “serious” it is intended not only a violation that involves protected persons or objects, but also a conduct that breaches important values despite the fact that does not physically endangered a person or object.⁹⁶ Therefore, those violations would give rise to criminal liability.

Accordingly, taking in consideration the *ratio* of this principle and even demands of certainty and humanity, there is no reason to conclude that a violation of IHL would be left unpunished simply because it was an AWS the direct agent of the unlawful act.

B. Mental element/ *mens rea*

In international law, criminal liability is designed to punish serious violations of IHL carried out intentionally.

⁹⁴Van Schaack, B. “Crimen Sine Lege: Judicial Lawmaking at the Intersection of Law and Morals”, *The Georgetown Law Journal*, Vol.97, No. 119 (January 1st 2008), 119-192, p. 119.

⁹⁵*Ibid*, p. 174.

⁹⁶ICRC. “Rule 156, Definition of War Crimes”. *IHL Database, Customary IHL*. Available at: https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule156 . Consultation date: February 26th 2020.

Pursuant to chapter 3 of the Rome Statute, referred to as “General Principles of Criminal Law”, article no. 30.⁹⁷ establishes that responsibility depends on a criminal act whereas the material elements of the crime fulfil two requirements: they are committed with intention and knowledge.

By “intention”, number 2 of the mentioned article states that it must be understood, regarding both the conduct and its effect, as the agent proposed to adopt the conduct and intended for the effect to occur or was “aware that it would take place in a normal order of events”. On the other hand, “knowledge” means awareness that a consequence will occur.

If a case happens whereas the operator used the AWS with the intention of committing a war crime or without having fulfilled his obligations, the current rules established in ICL will be appropriate⁹⁷ to address the accountability for the crime committed.

However, if the system causes damages through an unpredictable behaviour, the matter of accountability will not have a straightforward answer. When combining a highly complex system to a particularly rapid pace of response, it is not unlikely that a human agent will not be able to correct its action in time for a disastrous consequence, either because the system reacted faster than the human agent could predict, or it can simply happen that their complexity can make their behaviour incomprehensible to human operators.⁹⁸

Due to their particular nature, malfunctions and coding errors, or even in the possibility of bugs or cyber attacks, could entail disastrous consequences⁹⁹ without knowledge or intent of the occurred. Therefore, in any of those cases, the machine will in fact carry out the criminal behaviour without, however, meeting the two requirements stated above: having the knowledge or intent.

Nevertheless it is factually and morally impossible to hold the system accountable, by allowing AWS to make independent decisions on the battlefield, we are before a break

⁹⁷Crootof, R. *Op. Cit.*, p. 1389.

⁹⁸Scharre, P. *Op. Cit.*, p. 27.

⁹⁹*Ibid.* P. 8.

in the chain of command and therefore responsibility has to be “traced back to some persons in the decision-making chain”.¹⁰⁰

Indeed, although these autonomous systems act independently, it does not act wilfully, and therefore are “incapable of committing a chargeable offense”¹⁰¹.

Thus, concerns arise on whether ICL has proper instruments to enforce accountability if certain functions are delegated without a human agent to have effective control over it. Indeed, if there are no supervision obligations that must be fulfilled, it is not plausible that the requirements of knowledge and intention would be legally fulfilled.

So the matter of accountability for a crime without anyone to link the direct intention for the created result seems to not have a clear answer in the *mens rea* requirement as currently interpreted. Therefore, it appears to be crucial to clearly establish those obligations in order to avoid a responsibility gap and to prevent disastrous consequences to happen without no one to be held accountable.

6. International Responsibility for unlawful acts carried through AWS

In order to achieve its main purpose of protecting individuals, effectiveness demands that accountability be enforced in the event of a violation of IHL rules or principles. Indeed, it must be ascertained who can be held accountable for an unlawful act carried through AWS and the legal basis for it.

Thus, even though IHL creates obligations primarily for States, specially attending its *ius cogens* nature, it is peacefully accepted it is also binding to international organizations (IO) and it also sets out legal obligations for individuals such as military personnel, combatants and civilians.¹⁰²

¹⁰⁰Amoroso, D.; Tamburrini, G. *Op. Cit.*, p. 15.

¹⁰¹Crootof, R. *Op. Cit.*, p. 1380.

¹⁰²Tavares, M. (2020) – “Direito Internacional Humanitário”. *Op. Cit.* Pp. 266-267.

As mentioned before in this paper, the accountability issue raised by AWS in the battlefield is intensified by the large number of subjects that might have responsibility if a crime is committed. Thus, having ascertained who has the obligations to comply with IHL, we will first address the State Responsibility and later the possibility of individual liability. On the final part of this heading, we will explore these two types of responsibility and make final conclusions on accountability regarding unlawful acts committed through AWS.

Given the scope of this dissertation, the responsibility of IO or the potential liability of private parties to the conflict are not covered in this paper.

6.1. Ascertaining States Responsibility for AWS unlawful acts

State Responsibility¹⁰³ for wrongful acts first took place after the atrocious acts committed during WW II as a form of remedying human rights violations.¹⁰⁴ Therefore, the Nuremberg and Tokyo Trials were the first instances to address State Responsibility for unlawful acts.

Not neglecting the potential harm of AWS, it seems undeniable that its deployment comes with a lot of advantages too. And when ascertaining the likely strategic, humane and financial advantages of the usage of AWS, it appears that States are the main beneficiaries of its use. Otherwise, we would not be facing a worldwide race for acquisition and deployment of these weapons.

As mentioned previously, the basis of State Responsibility can be found in numerous international treaties and in Customary International Law.

State Responsibility has two cornerstones: failure to comply with its international obligations, on the one hand, and for the practice of international wrongful acts, on the other.

¹⁰³Since “State Responsibility” is an established term in the law, the text of this paper shall use ‘state responsibility’ to refer to “state accountability.”

¹⁰⁴Malik, S. *Op. Cit.*, p. 631.

Pursuant to the common article 1.^o of the Geneva Conventions, States have a general obligation to comply with IHL.¹⁰⁵ In fact, the Geneva Conventions states several ways in which States can assure such requirements. Namely, States are under an obligation to disseminate the legal provisions of IHL, both to civilians and the military.¹⁰⁶ Moreover, States must ensure IHL standards in a way that ensures safety on non-combatants as established in articles 51.^o and 58.^o of AP I.

Moreover, article 2.^o/4 of the Charter establishes an obligation for member States to refrain from the threat or use of force on the international plan.

State Responsibility is based on customary international law after the Special Rapporteur Ago proposed to the International Law Commission (ILC) to codify the distinction between ordinary and aggravated State responsibility.¹⁰⁷

In 2001, the ILC adopted the Articles on the Responsibility of States for Internationally Wrongful Acts (ARSIWA). The attribution of international responsibility to a State must be seen in three stages: the origin, the existence of international obligations and lastly, the implementation of countermeasures that guarantee the fulfilment of those same obligations.¹⁰⁸

Pursuant to article 1.^o of the ARSIWA, “every internationally wrongful act of a State entails the international responsibility of that State” whereas article 2.^o o establishes that “there is an internationally wrongful act of a State when conduct consisting of an action or omission “(a) is attributable to the State under international law; and (b) constitutes a breach of an international obligation of the State”. Aggravated State Responsibility, on the other hand, is currently established in articles 40.^o and 41.^o.

Moreover, when establishing States Responsibility regarding AWS unlawful acts two things must be ascertained: the moment when responsibility should be established

¹⁰⁵Common article 1.^o of the Geneva Conventions states that “The High Contracting Parties undertake to respect and to ensure respect for the present Convention in all circumstances”.

¹⁰⁶ Art.^o 83.^o AP I.

¹⁰⁷ Bonafè, B. *Op. Cit.*, p. 19.

¹⁰⁸Tavares, M. (2020) – Responsabilidade Internacional dos Estados por Factos Internacionalmente Ilícitos” - In Lopes, José Alberto Azeredo (coordenador) (2020) – *Regimes Jurídicos Internacionais*. Vol.1, 1^a ed., Porto: Universidade Católica Editora, p.727-728.

and whether a State can be held responsible for an unlawful act where no human agent engaged directly.

Regarding the first part, for reasons of efficiency, the definition of State Responsibility cannot depend on the moment when the attack takes place (or “the timing of the attack”), but on the moment the system is activated. Whatever happens during the deployment of the AWS for the mission for which it was trusted to comply with IHL requirements, it will be responsibility of the State. And according to the maxima *ubi commoda, ibi incommoda*, by being the primary beneficiary of AWS development and deployment, States must remain all times responsible for their actions.

Regarding the second part, article 4.º of the ARWISA enshrines a general principle for the attribution of conducts to the State, according to which "the conduct of any State organ shall be considered an act of that State under international law". Thus, it concretizes the principle of the State unity.¹⁰⁹

In consequence of violating a legal obligation, the State must fulfil all obligations set out in articles 28.º *et seq.* namely, to cease that act, to offer assurance of non-repetition and make full reparation for the injury caused. The reparation can operate in the form of restitution, compensation or satisfaction, regardless of the source of the legal obligation.¹¹⁰ The purpose would be to eliminate the consequences of the illegal act, in the case of reparation, or to restore the situation to the one that existed before the wrongful act was committed¹¹¹ or omitted.

In cases where restitution shows materially impossible or inappropriate, compensation, as a monetary payment for assessable damage¹¹², may be more adequate, or even a combination of both.¹¹³ Satisfaction, on the other hand, may consist in an acknowledgment of the breach or formal apology, as stated by article 37.º ARSIWA. Nevertheless, the same article emphasizes the need to comply with the proportionality principle by recognizing the satisfaction cannot be a form of humiliation to the responsible State.

¹⁰⁹Tavares, M. (2020) – “Responsabilidade Internacional dos Estados ...” *Op. Cit.* Pp. 642-643.

¹¹⁰Crootof, R. *Op. Cit.*, p. 1355.

¹¹¹Gillard, E. “Reparation for violations of international humanitarian law”, *International Review of the Red Cross*, Vol.85, No. 851 (September 2003), 529-553, p. 531.

¹¹²Cfr. Art.º 36.º ARSIWA.

¹¹³Cfr. Art.º 34.º ARSIWA.

However, if the State's illegal act falls under the aggravated State Responsibility requirements, it raises obligations for all States in the international Community, namely, the obligation to cooperate to the end of the violation, not recognize as lawful "nor render aid (...) in maintaining that situation."¹¹⁴

Finally, on the third moment of international responsibility attribution, countermeasures can be implemented in order to guarantee the fulfilment of the State's obligations under the limits established in the Law of States Responsibility and with respect for the principle of proportionality.

6.2. Individual criminal responsibility

One of the foundations of ICL is the Latin brocade *nulla poena sine culpa*. Intimately related with the above mentioned legality principle and mental element requirement, it means that criminal responsibility lies on the moral responsibility. Or, as stated by the Court, "the foundation of criminal responsibility is the principle of personal culpability". Therefore, it means no one shall be held criminal responsible for acts he has not personally engaged.¹¹⁵

The need to hold individuals accountable for unlawful actions was first set out in the judgement of the Nuremberg Tribunal in which it was famously declared that "crimes against international law are committed by men, not by abstract entities, and only by punishing individuals who commit such crimes can the provisions of international law be enforced."¹¹⁶ Hereinafter, the "Nuremberg Principles" were recognized as customary international law by the UN General Assembly and formally codified.¹¹⁷

¹¹⁴Cfr. Art.º 41.º ARWISA.

¹¹⁵Prosecutor v. Tadic Judgment Case No. IT-94-1-A ICTY Appeals Chamber 15 July 1999. Parag. 185-187. Available at: <https://www.icty.org/x/cases/tadic/acjug/en/tad-aj990715e.pdf>. Consultation date: March 20th 2020.

¹¹⁶Principles of International Law Recognized in the Charter of the Nürnberg Tribunal and in the Judgment of the Tribunal, International Law Commission Report on the Work of Its Second Session, (1950). Available at: https://legal.un.org/ilc/texts/instruments/english/commentaries/7_1_1950.pdf

¹¹⁷General Assembly Resolution 95 (I), "Affirmation of the Principles of International Law recognized by the Charter of the Nürnberg Tribunal General Assembly", (December 11th 1946), New York. Available at: [https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/95\(I\)](https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/95(I)).

Even though at the time the Nuremberg Tribunal did not, and could not predict the existence of AWS, and therefore mentioning “abstract entities” cannot be employed literally in this context, the legacy of the Nuremberg Trials brought to international law two main principles: first, the idea of individual accountability for international crimes and second, the idea of a fair trial to all individuals which would safeguard the rights of the accused.

The first of those recognized principles states that “any person who commits an act which constitutes a crime under international law is responsible therefore and liable to punishment.”¹¹⁸

Currently, the subject of individual criminal responsibility is best regulated in the Rome Statute, pursuant to articles 25.^o *et seq.*

Therefore, on the following topic we will discuss the possibility of individual responsibility of programmers and military personnel, under existing rules of ICL.

A. Programmer

The process of decision of AWS, that is to say, the means and methods used to achieve the result pre-determined by a human operator will depend to a large extent on AWS in-built artificial intelligence.¹¹⁹ Indeed, its software is the ultimate foundation of these system's determinations.¹²⁰

Pursuant to article 30.^o of the Rome Statute, as previously mentioned, in order to establish culpability is needed to prove *mens rea*. But even though the programmer acting

¹¹⁸This principle is also laid down in article 7(1) of the Statute of International Tribunal for the Prosecution of Persons Responsible for Serious Violations of International Humanitarian Law Committed in the Territory of the Former Yugoslavia since 1991, henceforward Statute of the International Tribunal, which states: “A person who planned, instigated, ordered, committed or otherwise aided and abetted in the planning, preparation or execution of a crime referred to in Articles 2 to 5 of the present Statute, shall be individually responsible for the crime.”

¹¹⁹Malik, S. *Op. Cit.*, p. 634.

¹²⁰Wagner, M., (2014), *op. Cit.*, p. 1404.

is, in fact, *mens rea*, the programmer's action would have to be negligent.¹²¹ However, International Law does not recognize other type of culpability that it is not *dolus directus*.

In fact, one of the challenges for holding the programmer accountable for negligent behaviour is the machine-learning intrinsic characteristic of AWS. Giving their ability of self-learning both online and in the field, AWS may use the means and methods it was given to make decisions not always possible for a programmer to foresee. Thus, given the dynamic environment where an AWS is expected to perform, it may not be possible to predict the behaviour of the AWS software.¹²²

Also, AWS are extremely complex devices which a large number of people are expected to be involved in its development,¹²³ which may likely rise the "many hands" problem where the collective responsibility of the group for a particular outcome may be diluted and, as a consequence, no individual can often be held accountable for it¹²⁴.

In order to overcome this, some authors suggest a link of causality must be previously determined by extracting from the group of people involved in the process of developing the AWS, the ones who are directly responsible for the system's performance.¹²⁵

As regards programmers or designers being held accountable for negligent behaviour, some authors¹²⁶ claim that is a possibility only if the responsible subjects failed to supervise the development of AWS software or proper monitor its behaviour during the learning process.

SWATI MALIK¹²⁷, on the other hand, claims that, if the crime is not a result of *dolus directus*, the possibility of holding the programmer accountable will depend on the damage caused being excessive categorically and could not be defined as collateral

¹²¹*Ibid.*

¹²²*Ibid.*

¹²³Malik, S. *Op. Cit.*, p. 634.

¹²⁴Amoroso, D.; Tamburrini, G. *Op. Cit.*, p. 15.

¹²⁵*Ibid.*, p. 635.

¹²⁶Wagner, M. (2014), *Op. Cit.*, p. 1405.

¹²⁷Malik, S. *Op. Cit.*, p. 634.

damage. Although the author added that in order to ascertain accountability in these terms, *dolus eventualis*¹²⁸ would have to be accepted has a form of intent.

However, not only negligent culpability is excluded from current interpretation of the art.30.º of the Rome Statute but also ICL generally does not recognise negligence as being sufficient to establish criminal culpability.¹²⁹

B. Command Responsibility

Command responsibility is based on the principle that the individual who is in command of a certain action, remains responsible for its results whether it took direct participation in its perpetration. In the context of AWS, a commander's responsibility includes operator liability.¹³⁰

It is the case of a responsibility based on "a personal dereliction of duty on the part of a superior who was bound by a duty to act to prevent or punish the crimes of subordinates and who culpably failed to fulfil this duty".¹³¹ Thus, responsibility of the superior will arise if it fails to fulfil his duty to prevent the illegal action.

Pursuant to article 28.º of the Rome Statute, superior responsibility is established whenever the forces under the effective command control, or authority and control, of the military commander commit a crime as a result of his or her failure to exercise proper control over such forces. However, this responsibility is limited to cases in which the commander knew or should have known about the crime and failed to take all necessary measures to prevent it or repress it.

If a situation happens where AWS are sent to operations in which would exceed their capabilities to comply with IHL, the superior's responsibility appears rather

¹²⁸In the author view, "*Dolus eventualis* is such intent through which an individual is conscious of the likelihood of other illegal ramifications emanating from her actions yet she goes ahead with carrying out her principal actions." In Malik, S. *Op. Cit.*, p.634, note 84.

¹²⁹McDougall, C. "Autonomous Weapon Systems and Accountability: Putting the Cart before the Horse", *Melbourne Journal of International Law*, Vol. 20, No. 58, (2019), 58-88, p. 67.

¹³⁰Malik, S. *Op. Cit.*, pp. 635-636.

¹³¹Mettraux, Guénaél (2008) – *Command Responsibility in International Law – The Boundaries of Criminal Liability for Military Commanders and Civilian Leaders*, PhD dissertation, University of London The London School of Economics and Political Science, Law Department, p. 15.

unproblematic.¹³² But that would only happen in a context where all conditions are known in advance, which does not realistically cover most of the scenarios in the battlefield.

Therefore, respecting the establishment of *mens rea*, the International Criminal Tribunal for the Former Yugoslavia has stated the fulfilment of the criteria of what the superior “should have known” is met if the commander receives information that puts “him on notice of the risk of [...] offences by indicating the need for additional investigation”. The Tribunal also clarified, the received information does not have to include specific details but rather is enough that “he possessed information sufficiently alarming to justify further inquiry” in order to establish the superior’s *mens rea*.¹³³

In a case of indirect liability as this, the commander has effective control over his subordinates in such a way it is able to oversee his actions and capable of punishing any violation of the given orders.¹³⁴ However, regarding AWS it is not clearly established what a proper control over the system has to be in order to create a legitimate link between the AWS unlawful act and the responsible’s failure to fulfil his obligation of proper control and prevention.

Regarding this matter, it has been proposed to insert a recording device in AWS that would monitor and reconstruct what happens during the time of its operation. This would allow tracing its decisions and therefore create a path of accountability.¹³⁵

In that case, what is needed is not only to clearly establish what “effective control” has to be but also, to guarantee AWS are safely programmed to provide sufficient information and means to allow for the supervisor to repress an unlawful action. In that case, if the supervisor fails to prevent or repress such action, it could be held accountable under article 28.º of the Rome Statute.

¹³²Wagner, M. (2014), *Op. Cit.*, p. 1406.

¹³³Prosecutor v. Strugar, Case No. IT-01-42-A, Appeals Chamber Judgment, International Criminal Tribunal for the Former Yugoslavia, July 17th 2008. Available at: <https://www.icty.org/x/cases/strugar/acjug/en/080717.pdf> . Consultation date: May 2nd 2020, Parag. 298-299.

¹³⁴Crootof, R. *Op. Cit.*, p. 1379.

¹³⁵United Nations, Human Rights Council, Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns. U.N. Doc. No. A/HRC/23/47, (Apr. 9, 2013). Available at: https://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session23/A-HRC-23-47_en.pdf . Consultation date: March 22nd 2020. Parag. 81.

Therefore, one of the important reasons of ascertaining in advance who can be held accountable and under what circumstances is to avoid what is called a system of organized irresponsibility. That is to say a system whereas responsibility stumbles from one agent to the other and ultimately, no one there is to blame.¹³⁶

6.3. Relation between individual and State Responsibility

Indeed, the same criminal behaviour could give rise to either individual or State responsibility.

But the relation between State Responsibility and individual accountability, regarding its overlap or strict separation, it's a complex and controversial one, being possible to find traits that denounce its overlap while others imply their independence.

Thus, the overlap of these two types of responsibility can first be found in its common origin as both of them were developed around the concept of *erga omnes* obligations. This is to say, in both cases responsibility arises for the breach of an obligation owed to the entire international community.¹³⁷

The relation between these two different very important branches of responsibility is not clear, especially when different courts, framed in different legal regimes, have to pronounce on the elements of crimes entailing individual responsibility and those that entail state responsibility.¹³⁸

Indeed, the enforcement mechanism to individual responsibility is divided in different jurisdictions in a mixture of international and domestic criminal courts¹³⁹ – *ad hoc* tribunals with jurisdiction in specific areas, national criminal tribunals, mixed tribunals, and the ICC, established by the Rome Statute but only binding to the State

¹³⁶Wagner, M. (2014), *op. Cit.*, p. 1409.

¹³⁷Bonafè, B. (2009), *Te Relationship Between State and Individual Responsibility for International Crimes*. Boston: Martinus Nijhoff Publishers, p. 24.

¹³⁸Bonafè, B. *Op. Cit.*, p. 1-4.

¹³⁹*Ibid.*, p. 16.

parties. State Responsibility, on the other hand, is imputed by international courts, political bodies or, commonly, through the resort of international settlements.¹⁴⁰

However, one major difference can be found between the two regimes: while individual accountability entails a punitive function through the enforcement of ICL, the same cannot be said about State Responsibility. Indeed, in the long process of codification States has shown reluctant to the establishment of their criminal responsibility. In result, the ILC has eliminated all mentions that could entail the interpretation that State Responsibility is under a framework of criminal accountability.¹⁴¹

Thus, in regards to the complex relation between State responsibility and individual criminal accountability, although they share common traits and admitting the probability where in some cases both individual criminal accountability and State Responsibility may arise, these are separate regimes and therefore it must remain clear that these forms of accountability are complementary and not alternative to each other.¹⁴²

6.4. Preliminary Conclusions on Accountability for AWS unlawful acts

Attending what has been stated throughout this chapter, if a case happens where the unlawful behaviour of the AWS cannot be subsumed to a failure to comply with its international obligations, the allocation of responsibility to a State party appears to be more challenging.

Even though the ICJ already stated the viability of holding a State responsible despite the conviction of an individual, clarifying that “any other interpretation could entail that there would be no legal recourse available under the Convention in some readily conceivable circumstances”¹⁴³, some authors defend there must be an agent or

¹⁴⁰*Ibid.*, p. 193.

¹⁴¹*Ibid.*, pp. 226-227.

¹⁴²Chengeta, T. “Accountability Gap: Autonomous Weapon System and Modes of Responsibility in International Law”, *Denver Journal of International Law and Policy*, Vol.45, No.1, (2016), p. 2-3.

¹⁴³Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro), Judgment, I.C.J. Reports 2007, p. 43, parag. 180-182.

group of agents whose actions can be ascribed to a States authority and that those can be subsumed an internationally wrongful act – this is what SWATI MALIK¹⁴⁴ nominates as “innate causality”.

However, State responsibility must arise from the moment the weapon system is activated and regardless of the success of its operation or the unlawful act carried out recklessly. Indeed, in accordance with the principle of State unity and pursuant to article 4.^o of the ARWISA, States will always bare the weight of responsibility for the use of AWS regardless of individual responsibility that might arise.

Therefore, States cannot be irresponsible for unlawful acts and the fact that the crime is committed through an autonomous weapon should not change this premise since the machine will always be an instrument to commit a war crime. Moreover, this precise idea has been reaffirmed within the GEE meetings on CCW¹⁴⁵, regarding accountability in the context of AWS, where general understanding reached since 2017 was that States bear responsibility for acts carried out by AWS deployed under their authority.

In conclusion, not only States are morally more responsible for the hypothetical use of AWS but are also internationally responsible for the means of violence they decide to employ. Indeed, the ultimate decision to deploy autonomous weapons in an international armed conflict will be a State decision and therefore it is the responsibility of that State to ensure its compliance with IHL in all stages of the ODDA cycle.

However, for reasons of legal certainty, the possibility to hold a State responsible in those terms must be clearly poured into a binding regulation in order to avoid disastrous scenarios from happening without no one to hold liable for.

7. Refusing Impunity

¹⁴⁴Malik, S. *Op. Cit.*, p. 631.

¹⁴⁵Created in 2016 during the Fifth Review Conference of the High Contracting Parties to the Convention on CCW, the GEE was established as an open-ended group on emerging technologies in the area of lethal autonomous weapons systems.

The previous chapters attempted to deconstruct the complex reality that surrounds AWS and the current legal framework already in place. Throughout this paper, we have been discussing several characteristics and different scenarios for these autonomous systems and how they relate at different levels with the Law.

AWS should not be addressed as “agents in war” but instead as “tools” to achieve a military goal. Even though AWS has the ability to perform some task autonomously and technological evolution will most likely allow it to operate fully autonomously in the future, its role in the battlefield can only be internationally acceptable if it proves to comply with IHL rules and principles and responsibility in case of AWS unlawful acts can be ascertained and enforced.

Indeed, given that AWS and unlawful acts thereof are a complex new topic with legal challenges that have never been addressed before, it will be necessary to draft and implement specific legal instruments to regulate authorized capacities on autonomous mode, clarify obligations regarding its use and supervision and, lastly but not least, stipulate a revision system that efficiently attests its safety.

Thus, we defend the establishment of a regulatory system that accommodates efficiently the imminent use of autonomy in weaponry through a legal document that ensures international agreement on all the critical issues as well as equal binding, in particular, regarding accountability on the use of AWS in the battlefield. However, attending the legal weapon review process is a known topic of international disagreement with highly political weight a more careful approach should be implemented through a political declaration on this issue through which States would compromise on crucial procedures that ensures humanitarian protection.

7.1. Protocol on the development and deployment of weapons capable of operating autonomously

International peace would benefit from the establishment of a legally binding Protocol that takes in consideration technological advancements to happen in a not-so-distant future. Thus, the object of this legally binding instrument would be to regulate the use of autonomy in weapon systems rather than to only focus on autonomous systems.

This would enable international legislator to overcome what it seems to be a stalemate on the definition of “autonomous system” while it would allow covering a bigger spectrum of weaponry to be developed in the future.

Given the drastically different technological realities, an international legally binding protocol should establish fundamental principles to be complied with in the development and deployment of AWS, as it was discussed within the CCW meetings of 2018 and 2019. Those principles must contain legal and ethical criteria for the regulation of future weapons legal reviews. Namely, it should be clearly stated that IHL principles and requirements apply to AWS and human responsibility exists during all stages of the ODDA cycle.¹⁴⁶

Second, it is of pressing importance to clearly establish the obligation for State Parties to design and monitor the compliance with codes of conduct that will bind programmers and engineers to respect the set of principles established in said Protocol during the development stage while also establishing the obligation to State Parties to comply with this principles in the development of new autonomous weapons. While programmers would be held accountable for failing to comply with the binding Code of Conduct enforced by the State in which it was created, States would be held responsible for the breach of any international obligation.

Third, safety and humanity reasons demand international agreement on what specific functions and decisions could be left for autonomous systems in the battlefield, while meeting both certain ethical and legal criteria. In this sense, it has been advocated that States will need to develop national rules of engagement (ROE) and enforce norms of professional behaviour, “in order to inform what can be expected of a reasonable commander”.¹⁴⁷ By designing and limiting AWS’s field of action, the accountability of States and military commanders would be legally founded on the failure to fulfil their international binding obligations clearly poured under the Protocol.

¹⁴⁶Report of the 2019 session of the GEE. Parag.17.

¹⁴⁷ Trumbull IV, C. *Op. Cit.*, p. 589.

But regardless of the well established State responsibility for IHL violations, the international legislator would have to clearly incorporate in the Protocol that an unpredictable result caused by AWS should give rise to State Responsibility.

In this regards, it must remain clear that AWS ability to perform autonomously must not be confused with supervision. While autonomy means the ability to act and make decisions without being controlled, supervision lies on the obligation of a certain person to ensure something or someone behaves within the established set of rules.

Autonomy will indeed transform how humans interact with weapons but will not eliminate their role.¹⁴⁸ Therefore, it is of great importance to regulate who would be able to supervise AWS during its development, ensuring their specific training, in order to create a clear path of accountability.

7.2. International Political Declaration

As previously stated, the current system of weapons legal reviews in place offers very little transparency and international certainty. Thus, in order to, on the one hand, give the supervisor enough security in order to operate the AWS and on the other hand, avoid an accountability gap, the current weapons review system must be greatly improved.

Thus, a political declaration on AWS legal reviews would be a more effective approach in order to establish an international binding agreement on an uniform system of revision that sets out objective standards and requirements regarding legal reviews.

Moreover, it would be crucial for States to agree and compromise on specific standards and requirements for technical aspects such as the establishment of certified quality control measures in production process¹⁴⁹, duration of time in which AWS could be on autonomous mode and the margin of error considered to be acceptable and in accordance with IHL rules and principles.

¹⁴⁸ Boulanin, V.; Verbruggen, M. “*Mapping the Development...*”, *Op. Cit.*, p. 119.

¹⁴⁹ Trumbull IV, C. *Op. Cit.*, p. 571.

Ultimately, safety reasons and certainty demand that State parties conduct their reviews on a regular basis in accordance with a transparent and cooperative revision process, similar to the one implemented pursuant to article 7.º of the Ottawa Convention¹⁵⁰, while complying at the same time with the objective standards internationally established under the said Political Declaration.

¹⁵⁰Formally named Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction.

Conclusion

“To every man is given the key to the gates of heaven. The same key opens the gates of hell. And so it is with science.”

- Richard Feynman

As we been discussing throughout this paper, the imminent use of AWS in the battlefield poses complex issues which the established IL cannot currently address and deal with. Even though AWS do not appear to be categorically unlawful under the rules of the well established IHL and thus the *Jus in Bello* will continuously serve its purpose independently from the means of violence used to achieve the military goal, the same cannot be stated about the possibility of accountability for AWS unlawful acts.

Although it is materially possible for AWS to commit war crimes through its independent conduct, autonomous systems do not act wilfully and therefore lack moral agency to be held responsible for its unlawful acts. However, it is not legally or morally acceptable to allow a weapon system to act in the battlefield without strict rules to ensure accountability for unlawful acts committed through them.

Indeed, the imminence of AWS in the battlefield has brought to surface the fragilities of a weapons review system that seems very much unprepared to protect principles of humanity offering very little certainty and even less transparency. Moreover, the current system of accountability opens the door for too many people to be accountable and still, leaves very little certainty of that liability not to be diluted in none.

Given the complex challenges of accountability raised from the use of autonomous weapons in the battlefield, the time is ripe to rethink the current regulation in force and upgrade it to a system that ensures the efficiency of the existing legal framework given the risk of becoming obsolete in the face of a new weaponry reality. Thus, a legally binding protocol is required that regulates AWS authorized capabilities on autonomous mode and clarifies obligations regarding its use and supervision. Moreover, it is of pressing need to establish an international agreement on transparent and cooperative procedures for weapon legal reviews that ensures humanitarian protection.

However, it must remain clear that, given that the ultimate decision to deploy autonomous weapons in an international armed conflict is always a State decision, State Responsibility must be determined at the point in time that autonomous systems are activated and regardless of the success of its operation or the unlawful act carried out recklessly.

Therefore, States cannot exempt themselves from liability regardless of the negligence of the programmer or the unlawful act being the result of a reckless conduct. Also, given the maxima “*ubi commoda, ibi incommoda*”, not only States are the main beneficiaries of the use of such systems but also, given their international obligation to comply with IHL, they are also the main party responsible in the eventuality of unlawful acts being committed through AWS and must remain responsible through all stages of the ODDA cycle.

To conclude, future discussions on the topic would benefit from focusing on the human-machine relation, rather than on the machine itself, through a preventive approach rather than a reactive one, ensuring its durability. Discussions that focus on the concepts and nature of the machines will inevitably be outdated rapidly, considering the stunning speed of its expecting development. Therefore, focusing on prevention, supervision and accountability would open doors for better understanding which ultimately would give rise to international agreements based on consensual starting points and converging perspectives.

Ultimately, principles of certainty, legality and humanity demand a clear catalogue of obligations regarding AWS and how accountability and culpability will be determined for those who fail to fulfil said obligations. As things stand under the current legal framework, it is the most undesirable outcome: liability could fall on no one.

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