

AUTONOMOUS WEAPON SYSTEMS: THE POSSIBILITY AND PROBABILITY OF ACCOUNTABILITY

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ABSTRACT

This paper addresses the challenge of accountability that arises in relation to autonomous weapon systems (AWS), a challenge which focuses on the hypothesis that AWS will make it impossible to identify, hold liable, and punish those responsible for unlawful outcomes that result from their use. It is divided into five sections. Section I introduces AWS and the three dilemmas associated with them that are based on questions of international humanitarian law, the right to life, and accountability, and which collectively establish AWS as weapons of contention. After evaluating the evolution of accountability in international law and discussing its relevance in the context of AWS in section I, section II examines the concept of *meaningful human control* apropos AWS. Section III reviews the potential avenues of accountability attribution which may be available and section IV the feasibility of its assignment in case of commission of crimes impacted by the use of AWS. Based on this analysis, section V comments on whether the alleged AWS-specific accountability gap is real, and if so, whether it is possible to bridge the gap through extant laws or by proposing the development and introduction of a new framework. By demonstrating that accountability attribution is indeed quite complex in the case of AWS, this paper intends to situate the accountability debate in the midst of the extant possibilities offered by law to safeguard against any potential chasm and to guardedly dispose of the assumption that AWS would prove to be impossible to regulate.

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INTRODUCTION

Human history has time and again been witness to the agility of the iron-clad warrior sitting confidently atop a horse driving legions of armed subordinates into the battle field. However, as time went by, the protracted and calamitous chronicles of war operations habituated themselves to the gradually evolving nature of warfare, which began to include more and more mechanization along with elevated effectiveness attributable to heightened automation. Eventually, the horse warrior lost the battle of combat supremacy and was deftly overtaken by ranged weapons which were able to cause graver injury over greater distances than hand-to-hand confrontations. These projectile instruments of attack changed over time from antiquated javelins and bows and arrows to the

modern firearms that came into being after the invention of gunpowder.¹ The advent of these ranged weapons made war at a distance a reality.

For quite some time, the world has indeed been undergoing a weapons revolution wherein warfare is becoming more and more remote, if not in terms of its visibility on the battle field, then definitely by way of its operational command. This continuum of technological development in weapons has provoked compelling social, political, ethical, and legal discussions. For a long time, the rhetoric on military technologies was predominantly focused on armed drones that are seen to operate regularly in the air spaces of Afghanistan, Pakistan, Yemen, and other countries with and, at times, without the host State's consent.² As investments in weapons technology grow, the advent of the next stage of unmanned warfare—autonomous weapon systems (AWS)—has become definite, unless global measures taken in the near future can put an embargo on their development or control it in the very least. AWS' characteristic of self-determination in the critical functions of selecting and attacking targets combined with consistent machine learning is what differentiates them from armed drones. Additionally, the manifestation of unprecedented situations in conflict zones makes it possible for AWS to act in unforeseeable ways, thus making them weapons of extreme contention.

While debates on defining AWS are amplifying, they have yet to be delineated through a universal definition.³ The bewilderment with this new weaponry has only increased due to the existence and expansion of a category of weapons, such as Israel's Iron Dome Weapon System,⁴ which appears to have autonomous features but are still characterized as

¹ See, e.g., JOHN KEEGAN, *A HISTORY OF WARFARE* (1993); JOHN LANDERS, *THE FIELD AND THE FORGE: POPULATION, PRODUCTION, AND POWER IN THE PRE-INDUSTRIAL WEST* 153 (2005); KAUSHIK ROY, *WARFARE IN PRE-BRITISH INDIA – 1500 BCE TO 1740 CE* (2015).

² See, e.g., Sascha-Dominik Bachmann, *Targeted Killings: Contemporary Challenges, Risks and Opportunities*, 18 J. CONFLICT & SECURITY L. 259, 287 (2013); Max Byrne, *Consent and the Use of Force: An Examination of 'Intervention by Invitation' as a Basis for US Drone Strikes in Pakistan, Somalia and Yemen*, 3 J. ON USE FORCE & INT'L L. 97, 97 (2016); Ashley S. Deeks, *Consent to the Use of Force and International Law Supremacy*, 54 HARV. INT'L L.J. 1, 21 (2013), www.harvardilj.org/wp-content/uploads/2013/03/HLI101.pdf.

³ Michael Horowitz, *Why Words Matter: The Real World Consequences of Defining Autonomous Weapons Systems*, 30 TEMP. INT'L & COMP. L.J. 85, 92 (2016), <https://sites.temple.edu/ticlj/files/2017/02/30.1.Horowitz-TICLJ.pdf>.

⁴ Griff Witte & Ruth Eglash, *Iron Dome, Israel's Antimissile System, Changes Calculus of Fight with Hamas*, WASH. POST (July 14, 2014), www.washingtonpost.com/world/middle_east/israel-shoots-down-hamas-drone/2014/07/14/991c46da-0b47-11e4-b8e5-d0de80767fc2_story.html?tid=a_inl&utm_term=.0b9fd433676f.

semi-autonomous and generally not considered contentious with respect to the ongoing polemics on AWS. It may have something to do with the fact that the Iron Dome is used against incoming hostile projectiles and not against humans and that it is not an active provocateur in itself. For the purposes of this paper, weapons shall be categorized as AWS if they conform, in their critical functions, to the twin criteria of being autonomous and de-facto out-of-the-loop⁵ *after* they have been activated through human intervention even if humans remain on-the-loop⁶ in the bigger picture. For a weapon to be considered autonomous, the description of its task(s) also must be broad and approximate (and not exact) and it must be capable of using its artificial intelligence to determine independent courses of action that include a weapon's critical functions after collecting and processing information from its operational environment.⁷ Further, even if the weapon system continues to have an overseer, in principle making it an on-the-loop system, to be deemed autonomous, its supervision must be restricted so much so that the quality of the supervision may not be considered persuasive in a narrow time frame.⁸ This is where the concept of *meaningful human control* (MHC), which is of utmost importance in debating assignment of liability for AWS actions and which will be discussed at length later in this paper, mediates the discussion. Thus, when speaking of accountability for this variety of weapons, the author is essentially referring to accountability for AWS actions while they are veritably in their out-of-the-loop momentum and before their passive operator can intervene to regulate their behavior.

⁵ The concepts of "out-of-the-loop" and "on-the-loop" are detailed later in the paper yet for limited reference here, the former includes weapon functions that a machine is able to determine, trigger, and repeat without active instruction from a human. On the other hand, "on-the-loop" systems help human operators retain the overall control of a weapon's actions, such as by letting them have the final say in picking from a list of possible actions after the machine has surveyed the situation and suggested the most suitable action, etc. *See infra* Part II.

⁶ *See id.*

⁷ *See, e.g.,* VINCENT BOULANIN & MAAIKE VERBRUGGEN, MAPPING THE DEVELOPMENT OF AUTONOMY IN WEAPON SYSTEMS 76, 90, 92 (2017), https://www.sipri.org/sites/default/files/2017-11/siprireport_mapping_the_development_of_autonomy_in_weapon_systems_1117_1.pdf; ROBIN GEISS, THE INTERNATIONAL LAW DIMENSION OF AUTONOMOUS WEAPONS SYSTEMS 6 (2015), <http://library.fes.de/pdf-files/id/ipa/11673.pdf>; Michael C. Haas & Sophie-Charlotte Fischer, *The Evolution of Targeted Killing Practices: Autonomous Weapons, Future Conflict, and the International Order*, 38 CONTEMP. SECURITY POL'Y 281, 283 (2017).

⁸ *See* Guy Seidman, *The Origins of Accountability: Everything I Know About the Sovereigns' Immunity, I Learned from King Henry III*, 49 ST. LOUIS U. L. REV. 2 (2004).

The debate on the desirability of AWS is doubtlessly gaining steam. However, all arguments for and against this category of weapons continue to be preemptive as it is understood that despite ongoing research efforts, no AWS are operational at the moment. The discussions on AWS include disparate positions comprising advocates convinced of their inevitability and cautiously supportive of their development;⁹ critics persuaded by the evil that such weapons are capable of manifesting and in favor of imposing a preemptive ban on their development;¹⁰ and a middle lobby that is treading the ground with skepticism and recommending interim measures such as a moratorium on such weapons' development.¹¹

The nature of AWS is such that it is unsettled if they would enduringly be able to comply with the laws of war or international humanitarian law (IHL). The consummation of the IHL principles of distinction, proportionality, and military necessity are traditionally a soldier's responsibility to consider as she receives and examines information from the ground and establishes or alters her plan of action. Will AWS be able to tailor their responses apropos an extremely dynamic environment brimming with situations that have no precedents to conform to IHL? This is referred to as the IHL Argument, a response to which is hard to determine at this point. While it may seem like an unlikely prospect right now, with the pace of technological development that is bringing to reality much that was unlikely in the past, it seems injudicious to make a pronouncement of IHL compliance impossibility at this early stage. An addendum to this issue is AWS' possible amenability to error. Like any machine, AWS—no matter how meticulously built—

⁹ See, e.g., Evan Ackerman, *We Should Not Ban 'Killer Robots,' and Here's Why*, IEEE SPECTRUM (July 29, 2015), <http://spectrum.ieee.org/automaton/robotics/artificial-intelligence/we-should-not-ban-killer-robots>; Rosa Brooks, *In Defense of Killer Robots*, FOREIGN POL'Y (May 18, 2015, 9:08 AM), <http://foreignpolicy.com/2015/05/18/in-defense-of-killer-robots/>; Jai Galliot, *Why We Should Welcome "Killer Robots," Not Ban Them*, THE CONVERSATION (July 20, 2015, 12:17 AM), <https://theconversation.com/why-we-should-welcome-killer-robots-not-ban-them-45321>.

¹⁰ See, e.g., John Lewis, *The Case for Regulating Fully Autonomous Weapons*, 124 YALE L.J. 1309, 1313 (2015); Peter Asaro, *Ban Killer Robots Before They Become Weapons of Mass Destruction*, SCI. AM. (Aug. 7, 2015), www.scientificamerican.com/article/ban-killer-robots-before-they-become-weapons-of-mass-destruction/; Frank Sauer, *Stopping 'Killer Robots': Why Now is the Time to Ban Autonomous Weapons Systems*, ARMS CONTROL ASS'N (Oct. 2016), www.armscontrol.org/ACT/2016_10/Features/Stopping-Killer-Robots-Why-Now-Is-the-Time-to-Ban-Autonomous-Weapons-Systems.

¹¹ Christof Heyns (Special Rapporteur), Rep. on Extrajudicial Summary or Arbitrary Executions, U.N. Doc. A/23/27, at 22 (Apr. 9, 2013).

are likely to be influenced by hacking, errors of programme and hardware, etc. In addition, they also have the supplementary component of machine learning which also renders them unreliable to many minds.

The second solid argument against AWS lies in the right to life substratum, which also has its underpinnings in morality. Prominent human rights scholars like Christof Heyns question if handing over decisions of life and death to machines is a moral and possibly a legal transgression.¹² The proponents of this branch of argument position the fact that AWS can take such heavyweight decisions while lacking the conscience or the emotion, cognition, and mental state unique to humans as the reason to push for their control or elimination.¹³

The final argument, and the one that is most important for the purposes of this paper, is the question of accountability. Some scholars have highlighted the impossibility or futility of attempting to assign accountability under international law in cases of ‘crimes’ that are committed through the use of AWS as it is impractical to attribute liability to machines that cannot be punished.¹⁴ In contrast to the IHL and right to life arguments (both of which also require the assurance of accountability), it is perhaps the direct and encompassing issue of accountability in itself that—if resolved in favor of AWS—would make their opponents capitulate and accept their place in the tools of war. Or *au contraire*, if it is determined that accountability is indeed an insurmountable complication to traverse, this will be the final straw that would brand AWS as prohibited. In point of fact, it is the question of accountability that is the most legalistic of the three principal arguments and the only one that can be debated preemptively. Considering this, AWS’ receptiveness or aversion towards accountability will in all likelihood eventually tip the scale in favor of or against these weapons. Thus, even though there are extensive arguments for and against AWS this paper shall limit its analysis to the question of accountability.

Beginning with a brief discussion of the concept of meaningful human control (MHC) apropos AWS (section II), this paper delves into a

¹² *Id.* at 30.

¹³ See, e.g., John Thornhill, *Military Killer Robots Create a Moral Dilemma*, FIN. TIMES (Apr. 25, 2016), <https://www.ft.com/content/8deae2c2-088d-11e6-a623-b84d06a39ec2>; Bonnie Docherty, *Losing Control: The Dangers of Killer Robots*, LIVE SCI. (June 16, 2016, 8:17 AM), <https://www.livescience.com/55092-dangers-of-killer-robots.html>.

¹⁴ See, e.g., Rebecca Crootof, *A Meaningful Floor for “Meaningful Human Control,”* 30 TEMP. INT’L & COMP. L.J. 53, 55 (2015); James Walsh, *Political Accountability and Autonomous Weapons*, 2 RES. & POL., Oct.–Dec. 2015, at 1, 1–2.

review of the potential avenues of accountability (section III), and the feasibility of its assignment in case of commission of crimes effected by the use of AWS (section IV). Based on the substance of these sections, this paper will conclude whether the proclaimed AWS-specific accountability gap is real, and if so, whether it is possible to bridge this gap through extant laws or by the development and introduction of a new legal framework (section V).

I. ACCOUNTABILITY IN INTERNATIONAL LAW

The notion of accountability has played a momentous role in the development of law. It is a fairly broad concept and one that is not limited to law. In effect, law shares the use of the term with other significant disciplines, including ethics, philosophy, and political theory. According to Melvin Dubnick, the concept first appeared in the Middle Ages during the regime of William I, the first Norman king of England whose reign began in 1066.¹⁵ During his rule, he necessitated that all property holders make a record of what they possessed and that the information contained in the property holders' transcripts be registered by the king's agents into survey-like public records that came to be known as the Domesday Books.¹⁶ These records were used to determine the rights and revenues, including taxes, that were due to the king from his subjects.¹⁷ So in this sense, the word accountability really started as a derivation of 'accounting' and became the basis of bookkeeping that postulated the accountability of individuals to their king for all that they owned. In time, the order shifted to hold the elected or the ruling accountable to the laws of the land and to those who elected them or whom they ruled.¹⁸

The dominant sentiment that forms the foundation of modern accountability is that when administrative control moves from the key players (e.g., taxpayers) to a representative (e.g., government), the original central figures continue to exercise control over the actions of

¹⁵ Melvin J. Dubnick, *Seeking Salvation for Accountability* (Prepared for Delivery at the 2002 Annual Meeting of the Am. Pol. Sci. Ass'n), <http://mjdubnick.dubnick.net/papersrw/2002/salv2002.pdf>.

¹⁶ *Discover Domesday*, NATIONAL ARCHIVES (U.K.), <http://www.nationalarchives.gov.uk/domesday/discover-domesday> (last visited Mar. 31, 2018).

¹⁷ *Id.*

¹⁸ *See, e.g.*, FRANCIS FUKUYAMA, *THE ORIGINS OF POLITICAL ORDER: FROM PREHUMAN TIMES TO THE FRENCH REVOLUTION* (2011); CAROLYN HARRIS, *MAGNA CARTA AND ITS GIFTS TO CANADA: DEMOCRACY, LAW, AND HUMAN RIGHTS* (1st ed. 2015).

the representative by bringing the latter to account and even enforcing penalties, if it should be so required, through the agency of accountability.¹⁹ Like its original specimen ‘accounting,’ accountability too is largely about power entrustment, subsequent performance evaluation, and imposition of corrective measures.²⁰ Thus, accountability includes the elements of both blameworthiness, which gives rise to liability, and enforcement, which gives rise to punishment and other corrective measures. As a concept, accountability is inclusive of responsibility and liability but is broader than either or even both collectively.

Codification of laws has placed special emphasis on including terms such as liability, accountability, and responsibility in legal codes so as to empower legal instruments enough to enable them to charge natural persons and legal entities like companies and governments for damages caused via certain events.²¹ Historically, there has been widespread attention dedicated to constituting robust institutions and mechanisms to sanction those held responsible for having perpetrated crimes (particularly the ones recognized as such under international law) and this interest in the assignment of liability and consequent punishment has not ebbed in recent times.²² While responsibility and liability are characteristic concepts used in law, the term accountability—though principally used interchangeably with responsibility—does not have a clear-cut legal definition despite its frequent supplication by international lawyers in international legal fora.²³ Generally though and in the same vein as portrayed by Ruth Grant and Robert Keohane in their paper on accountability,²⁴ the key characteristics of accountability include

¹⁹ Staffan I. Lindberg, *Accountability: The Core Concept and its Subtypes 1* (Afr. Power & Politics Programme, Working Paper No. 1/2009), <https://assets.publishing.service.gov.uk/media/57a08b4740f0b652dd000bd6/APPP-WP1.pdf>.

²⁰ *Id.*

²¹ Ivo Giesen & François G.H. Kristen, *Liability, Responsibility and Accountability: Crossing Borders*, 10 *UTRECHT L. REV.* 1, 2 (2014).

²² Cenap Cakmak, *Historical Background: Evolution of the International Criminal Law, Individual Criminal Accountability and the Idea of a Permanent International Court 1* (Univ. of Denver Human Rights & Human Welfare, Working Paper No. 39/2006), www.du.edu/korbel/hrhw/workingpapers/2006/39-cakmak-2006.pdf.

²³ Jutta Brunnée, *International Legal Accountability through the Lens of the Law of State Responsibility*, 36 *NETH. Y.B. INT'L L.* 3, 7 (2005).

²⁴ Ruth W. Grant & Robert O. Keohane, *Accountability and Abuses of Power in World Politics*, 99 *AM. POL. SCI. REV.* 29, 29 (2005) (stating that the term accountability as used by the authors “implies that some actors have the right to hold other actors to a set of standards, to judge whether they have fulfilled their responsibilities in light of these standards, and to impose sanctions if they determine that these responsibilities have not been met”).

extraneousness, social interplay, and a hierarchy of rights resulting from the higher moral ground of those whose rights have been wronged, making it possible for them to seek reparations publically.²⁵

In international law, the expansive concept of accountability is ever-evolving and continues to expand beyond its traditional bracket of civil and criminal accountability.²⁶ A factor contributing to this evolution is that institutions, including the state, are gaining importance and consequently power, thus necessitating a move against defining accountability narrowly.²⁷ As a process of ascribing responsibility, accountability has both retrospective and prospective implications. While a primary aspect of it is to seek reparations, it is also forward-looking in that it has a definite effect on prospective behaviors; it either regulates or prevents them or in the very least, it provides precedents to the person undertaking certain actions on the reactions to expect. It can come in many forms, including legal accountability and political accountability. While this paper may refer to other forms of accountability in passing, its motivation is to discuss legal accountability over any other form. Thus, for the purposes of this paper, the word ‘accountability’ shall be used interchangeably with legal accountability, which can also come in many forms, including criminal and civil accountability as well as state responsibility.

Overall, the axiom of accountability commands that all individuals, institutions, and organizations as well as governments remain answerable to the respective communities within which they exist. Moreover, without the assurance of accountability, the right to life in particular and IHL generally could never be sustained. Both command not only an embargo on the arbitrary deprivation of life and imposition of hardship but also the guarantee of accountability should either such deprivation or imposition occur.

²⁵ Deirdre Curtin & André Nollkaemper, *Conceptualizing Accountability in Public International Law*, 36 NETH. Y.B. INT'L L. 3, 4 (2005).

²⁶ *Id.* at 5–6; STEVEN R. RATNER ET AL., ACCOUNTABILITY FOR HUMAN RIGHTS ATROCITIES IN INTERNATIONAL LAW: BEYOND THE NUREMBERG LEGACY 167–76 (3d ed. 2009).

²⁷ See Lauren E. Fletcher, *A Wolf in Sheep's Clothing? Transitional Justice and the Enforcement of State Accountability for International Crimes*, 39 FORDHAM INT'L L.J. 447, 451 (2016); Sérgio Praça & Matthew M. Taylor, *Inching Toward Accountability: The Evolution of Brazil's Anticorruption Institutions, 1985–2010*, 56 LATIN AM. POL. & SOC'Y 1, 2–3 (2014).

A. THE CASE FOR AND AGAINST AUTONOMOUS WEAPON SYSTEMS

Concomitant with the realization that AWS are being developed has also been the raising of concerns from various quarters that fear a reality where the existence of humanity may be threatened by the prevalence of such systems.²⁸ AWS present definite formative, functional, legal, and ethical challenges to warfare that nations have never had to confront before the idea of AWS came into being. And with this awareness, two antithetical points of view have emerged: one that is in favor of imposing a preemptive ban on AWS and the other that seeks to regulate their development and use in accordance with existing or new law as this lobby considers their eventual materialization inevitable. Several actors, including Human Rights Watch, which published a report condemning AWS as incompatible with IHL,²⁹ have issued calls for an outright ban on their development and use. Even as AWS were receiving extensive critical analysis from diverse quarters, Human Rights Watch buttressed its original point by releasing another report a few years later recommending its earlier AWS prohibition position, but this time basing the suggestion in the accountability gap in civil law and criminal law that the use of fully autonomous systems is allegedly foreseen to generate.³⁰ Around the same time, the Future of Life Institute—a volunteer research and outreach organization that considers new technologies and challenges “[t]o catalyze and support research and initiatives for safeguarding life and developing optimistic visions of the future”³¹—issued an open letter calling for a ban on AWS.³² The letter has the support of many artificial intelligence researchers and has also been endorsed by many prominent global figures, including Stephen Hawking and Noam Chomsky.³³

²⁸ Jack M. Beard, *Autonomous Weapons and Human Responsibilities*, 45 GEO. J. INT’L L. 617, 619 (2014), <http://www.law.georgetown.edu/academics/law-journals/gjil/recent/upload/zsx00314000617.PDF>.

²⁹ Bonnie Docherty, *Losing Humanity: The Case against Killer Robots*, HUMAN RIGHTS WATCH (Nov. 19, 2012), www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots.

³⁰ BONNIE DOCHERTY, MIND THE GAP: THE LACK OF ACCOUNTABILITY FOR KILLER ROBOTS (2015), https://www.hrw.org/sites/default/files/reports/arms0415_ForUpload_0.pdf.

³¹ *The Future of Life Institute (FLI)*, FUTURE OF LIFE INST., <https://futureoflife.org/team/> (last visited Mar. 31, 2018).

³² *Autonomous Weapons: An Open Letter from AI & Robotics Researchers*, FUTURE OF LIFE INST. (July 28, 2015), <https://futureoflife.org/open-letter-autonomous-weapons>.

³³ *Id.*

On the other end of the spectrum are voices that deem calls for a preemptive ban on AWS premature. Critics of the calls for ban include the likes of Charles Dunlap whose commentary focuses on the likelihood of bans on all kinds of new weaponry and not just AWS. He states that “[p]art of the problem lies with the fact that international law may condemn a particular weapon based on a technological ‘snapshot in time’ and cannot accommodate later advancements that may undermine the original scientific premise of reducing casualties.”³⁴

He provides the example of chemical weapons to illustrate how preemptive bans may deprive humanity of exploring the option of developing weapons that have the potential to reduce deaths and suffering substantially.³⁵ Similarly, Jonathan Alexander argues that due to the misplaced perception that war is about killing one’s enemy and not solely about dictating one’s will on the enemy, a process which may or may not include death and suffering, nations prematurely try to put a stop to the development of creative solutions to lethal weapons.³⁶ Such scholars blame sentimentalism as the dominant feeling against rationality and technological knowledge that determines attitudes towards new weaponry and the potential for related legislative drafting.³⁷ If this anthropological illustration of the bias towards innovative weaponry were to be considered, it may perhaps become easier to understand the animosity towards drones.

Internationally, while consultations on AWS have soared, as of now, there does not seem to be a resolute global position for or against them. The 2016 Experts Meeting on Lethal Autonomous Weapons convened under the aegis of the Convention on Certain Conventional Weapons (CCW) witnessed discussions on the four key issues of definitions, human control, accountability, and weapons review, and recommended their further exploration.³⁸ Further, the primary outcome of

³⁴ Charles J. Dunlap Jr., *To Ban New Weapons or Regulate their Use*, JUST SEC. (Apr. 3, 2015), <https://www.justsecurity.org/21766/guest-post-ban-weapons-regulate-use>.

³⁵ *Id.*

³⁶ Jonathan Alexander, *Optional Lethality*, HARV. INT’L R. (May 6, 2006), <http://hir.harvard.edu/the-future-of-waroptional-lethality/>.

³⁷ See, e.g., Medoti Hadji-Janev & Kiril Hristovski, *Beyond the Fog: Autonomous Weapon Systems in the Context of the International Law of Armed Conflicts* 57 JURIMETRICS J. 325, 325 (2017); Gregory P. Noone & Diana C. Noone, *The Debate Over Autonomous Weapons Systems*, 47 CASE W. RESERVE J. INT’L L. 25, 25 (2015).

³⁸ Rep. of the 2016 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS), submitted by the Chairperson of the Informal Meeting of Experts, at 14–15, 17, [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/DDC13B243BA863E6C1257FDB00380A88/\\$file/ReportLAWS_2016_AdvancedVersion.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/DDC13B243BA863E6C1257FDB00380A88/$file/ReportLAWS_2016_AdvancedVersion.pdf).

the Fifth Review Conference of the High Contracting Parties to CCW that took place in December 2016 was a decision to set up a Group of Governmental Experts to lead discussions on lethal autonomous weapon systems apropos the provisions contained in the CCW.³⁹ From these developments, it can be pronounced that even with all the deliberations and newsprint being dedicated to AWS, the world is still at a preliminary stage of establishing a firm position on them.

B. THE ACCOUNTABILITY ARGUMENT SPECIFIC TO AUTONOMOUS WEAPON SYSTEMS

Accountability is both a component and a necessity of the interplay between law and morality, and morality—as the foundation on which law stands—demands that for all wrongs committed, it be possible to hold someone liable. At the moment, machines are not considered the subjects of law, and it is an understandable concern of legal scholars and others that the use of AWS in armed conflicts may create an accountability gap giving rise to a culture of impunity in combat and ultimately lead to a drastic dehumanization of war-time conduct. It is true that even before discussions specific to AWS became prevalent, a switch from humans to machines, triggering action on the battle field in their semi-autonomous versions, had caught global attention. However, in case of remote-controlled weapons, there is no debate on assignment of accountability as it is forthright enough that, even if the machine may be the ultimate medium of a crime, it is a human or a group of humans that is controlling the machine's actions and that those individual(s) remain responsible for all violations perpetrated by it. However, AWS with their artificial intelligence and technically out-of-the-loop design present many new issues of contention. How would the element of *mens rea* be conclusively proven to establish the accountability of a human? Another question is whether AWS have a chance of being considered the legal or moral agents of those who develop and/or employ them thus making it viable to backtrack the chain of probable offenders and determine the human or state (depending on the avenue of accountability being

³⁹ Fifth Review Conference of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, at 9, CCW/CONF.V/10 (Dec. 23, 2016), <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2016/RevCon/documents/final-document.pdf>.

pursued) *most* responsible for the actions of the machine. There is indeed no doubt that the accountability argument is a complicated one.

What helps this paper's analysis of this argument though is that it is one that can be discussed in the present and does not have the temporal constraints of the other two—IHL and Right to Life—arguments that come up most in the accusations against AWS. Accountability as a notion is not frustrated by our lack of a concrete idea of what AWS will eventually become and it will remain steadfast no matter what form these weapons will take eventually. Thus, unlike with the other two arguments, we can discuss accountability comprehensively even at this budding stage. Second, accountability is a well-established pillar of law with extensive commentary making it notably open to scrutiny.

II. MEANINGFUL HUMAN CONTROL, ACCOUNTABILITY, AND AUTONOMOUS WEAPON SYSTEMS

All weapons in the history of mankind have been known to be directed by humans and used as instruments of war and not a force unto themselves. That was the case until now, when we are at the verge of entering a world of machines that are equipped with sensory devices to perceive their environments and take decisions, in principle, without continual human involvement. With the growing consciousness about the possibility of AWS deployment to fight wars comes the realization that humans are in the process of inventing super weapons that would make them abdicate exhaustive control over use-of-force decisions and instruments. Essentially with the advent of AWS in combat zones, humans would have outsourced determinations of life and death to machines that would learn while engaged in hot spots and act in unforeseeable ways.

It is at this point that the introduction of the concepts of “in-the-loop,” “on-the-loop,” and “out-of-the-loop” technology with respect to AWS is necessary. This categorization has its basis in the degree of involvement of the human operator(s) of a weapon during the time the weapon remains functional.⁴⁰ In-the-loop weapons are those that are

⁴⁰ See GARY SCHAUB & JENS KRISTOFFERSON, IN, ON, OR OUT OF THE LOOP? 9–10 (2017), http://cms.polsci.ku.dk/publikationer/in-on-or-out-of-the-loop/In_On_or_Out_of_the_Loop.pdf; William C. Marra & Sonia K. McNeil, *Understanding “The Loop:” Humans and the Next Drone Generations*, 50 ISSUES IN GOVERNANCE STUD., Aug. 2012, at 1, 2, <https://www.brookings.edu/wp-content/uploads/2016/06/27-humans-drones-marra-mcneil.pdf>.

operated by humans. With such weapons, the element of human control is maximal, and there is a direct line of delegation. Most of the traditional weaponry including guns and swords are categorized as such. Further, on-the-loop weapons operate under the watchful eye of a human operator and require authorization from their controller to take action. At the other extreme end of the continuum are out-of-the-loop weapons, which by definition are self-governing automatons that need no human mediation to perform all their functions in any environment in which they are released. Our understanding of such machines makes them seem most undesirable, and much commentary on AWS perceives them to conform to the characteristics of out-of-the-loop systems. The rationale for their criticism rests largely on this perceived description.⁴¹ There is not sufficient understanding of how AWS, if their development sustains, would turn out to be, yet it is essential that we establish the possibility or unlikelihood of MHC in their structures at this early stage to rule out their illegality or to condemn them as unlawful weapons.

The concept of MHC or “appropriate human judgement”⁴² is a product of many regulation-associated sentiments related to AWS. Heather Roff, a senior researcher at the University of Oxford’s Department of Politics and International Relations, argues that the policy and legal implications of MHC and appropriate human judgement are the same.⁴³ This paper, for the sake of symmetry shall use MHC throughout its text and proceed on the premise that all similar terms incorporate the necessary elements of human control into their particulars. This component of human oversight is what saves a weapon from being indiscriminate and as a consequence protects it from being prohibited like other weapons that lack this element. The bans on biological and

⁴¹ FUTURE OF LIFE INST., *supra* note 32.

⁴² During the review conferences of the CCW, some states including the Netherlands and Poland advocated for the human control standard to be named MHC while others like the United States professed their preference for the appellation “appropriate human judgement.” Still others like the United Kingdom were encouraging of the inclusion of human control without being too rigid about its frame of reference. For more information on state-proposed nomenclature, see *2016 Meeting of Experts on Laws*, UNITED NATIONS, [http://www.unog.ch/80256EE600585943/\(httpPages\)/37D51189AC4FB6E1C1257F4D004CAF B2](http://www.unog.ch/80256EE600585943/(httpPages)/37D51189AC4FB6E1C1257F4D004CAF B2) (last visited Mar. 18, 2018).

⁴³ Heather M. Roff, *Meaningful Human Control or Appropriate Human Judgment? The Necessary Limits on Autonomous Weapons* 3–4 (Briefing Paper for delegates at the Review Conference of the Convention on Certain Conventional Weapons (CCW) Geneva, Dec. 12–16, 2016, Arizona State University), <https://globalsecurity.asu.edu/sites/default/files/files/Control-or-Judgment-Understanding-the-Scope.pdf>.

chemical weapons are relevant cases in point here.⁴⁴ MHC is also the only element related to AWS that has the benefit of state concurrence. While some states have affirmed their approval of the principle, others have questioned the legality of the weapons that may be devoid of it.⁴⁵

Article 36—a non-profit organization working on the “prevention of the unintended, unnecessary or unacceptable harm caused by certain weapons”—coined the term MHC,⁴⁶ which has since been used extensively in discussions on AWS. The term has been literally interpreted to mean “control over the selection and engagement of targets, that is, the ‘critical functions’ of a weapon.”⁴⁷ Identifying MHC as the missing element that makes certain categories of weapons with obvious military advantages objectionable is the first step towards recognizing the need for greater human control on arms. Currently, the concept of MHC is being heralded as a feasible fix to the wide-ranging objections to AWS. However, even though the term is being used often in debates on AWS, it does not yet have a place in international law thus making its description non-standard and not one having legal authority.⁴⁸ While one state may refer to MHC as an operator’s approval of each action to be taken by a weapon (essentially meaning that at best a weapon system may be a semi-autonomous one), to another it may only require the operator’s power to refuse permission for particular courses of action while letting the weapon run on a largely autonomous mode otherwise.⁴⁹ There may be others still that consider the programming of a weapon system as sufficient MHC.⁵⁰ However, even this lack of general agreement over substance and semantics has not dulled the enthusiasm over MHC. And rightly so. The lack of understanding of MHC is inviting wide debate, and this is for the best considering that we do not quite grasp the mechanizations of AWS themselves as of now and that it

⁴⁴ *Chemical and Biological Weapons*, INT’L COMM. OF THE RED CROSS (Apr. 8, 2013), <https://www.icrc.org/en/document/chemical-biological-weapons>.

⁴⁵ See *Country Policy Positions*, CAMPAIGN TO STOP KILLER ROBOTS (Mar. 25, 2015), http://www.stopkillerrobots.org/wp-content/uploads/2015/03/KRC_CCWexperts_Countries_25Mar2015.pdf.

⁴⁶ ARTICLE 36, KILLER ROBOTS: UK GOVERNMENT POLICY ON FULLY AUTONOMOUS WEAPONS 3 (Apr. 2013), http://www.article36.org/wp-content/uploads/2013/04/Policy_Paper1.pdf.

⁴⁷ *Killer Robots and the Concept of Meaningful Human Control*, HUMAN RIGHTS WATCH (Apr. 11, 2016, 12:01 AM), www.hrw.org/report/2012/11/19/losing-humanity/case-against-killer-robots.

⁴⁸ Michael Horowitz & Paul Scharre, *Defining “Meaningful Human Control” Over Autonomous Weapons*, JUST SEC. (Mar. 19, 2015), <https://www.justsecurity.org/21244/defining-meaningful-human-control-autonomous-weapon-systems>.

⁴⁹ Crotofof, *supra* note 14, at 54.

⁵⁰ *Id.*

would be premature to get locked into definitions while still not being familiar with the programming that a safeguard is supposed to intervene in. Thus, for now, as technology develops, flexibility on understanding MHC seems to be the better standpoint and so is giving time to law to seek adaptive solutions.⁵¹

It is important to note here the substantial effect that the introduction of MHC is likely to have on the accountability gap purportedly created by the use of AWS, a gap which scholars and scientists have been skeptical of. It is very probable that the protection of MHC would help close this gap in many minds as it would aid in the attribution of liability to the person(s) who exercised MHC in the deployment of AWS and thereby ensure that accountability remains possible. I do believe that even at this early stage, it remains viable to associate MHC with AWS and perceive them as weapons that have to be under at least the passive scrutiny of humans. MHC is indeed the benchmark that would make all the difference to AWS being recognized as mechanized leviathans or as systems that have to be programmed as on-the-loop weapons that are susceptible to limited yet certain human control.

It is entirely possible that the future cementing of MHC's definition may necessitate an AWS ban if it is discovered that this category of weapons cannot uphold the elements of MHC. Nevertheless, it is unlikely that the evolution of the concept would lead to an embargo on AWS. With the differing voices on AWS, MHC appears to be the redeeming feature of this category of weapons and not prima facie the element that will lead to their ban. Upholding MHC in AWS would also assist in precluding many associated objections and not just those based in the accountability question. Some legal scholars are of the view that maintaining MHC is also a moral requirement which would help ensure that use of force decisions in the context of AWS are taken with the care and diligence those decisions necessitate.⁵²

⁵¹ Colin B. Bicker, *A View from 400,000 Feet: International Law and the Invisible Hand of Technology*, 232 *CARDOZO L. REV.* 149, 152 (2001).

⁵² See, e.g., Michael Horowitz & Paul Scharre, *Meaningful Human Control in Weapons Systems: A Primer* (Ctr. for a New Am. Security, Working Paper, Mar. 2015), https://www.files.ethz.ch/isn/189786/Ethical_Autonomy_Working_Paper_031315.pdf; Jeroen Van Den Hoven et al., Delft Univ. of Tech., *Why the Future Needs Us Today: Moral Responsibility and Engineering Autonomous Weapons Systems*, [https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/89116E298AE593C2C1257E2A00413D61/\\$file/2015_LAWS_MX_VanDenHoven.pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/89116E298AE593C2C1257E2A00413D61/$file/2015_LAWS_MX_VanDenHoven.pdf).

MHC, which may until now have been assumed to be implicit in the laws of war through the principles of distinction, proportionality, and military necessity, is emerging as the safeguard that needs a strengthened foothold in international law to regulate this new genre of weapons. It is conceivable that, considering the wide attention this yet quite abstract idea is receiving, MHC may be the fourth contender for the principles of IHL governing the use of force that is expected to make more forceful the prevailing rules of international law on weapons targeting and become the ultimate authority on the maintenance of accountability. Another reason MHC is being touted as the panacea that would close the alleged accountability gap is that with the introduction of a formal, concrete, and consensus-based MHC, the notion of AWS in a form that allows for broader on-the-loop supervision will become acceptable. It is true that some of the decisions made by these systems will require instantaneous determinations quite beyond the capacity of the human brain. Nevertheless, even this variety of limited human supervision and intervention is likely to keep the systems in check and ensure that even if not all their undesirable outcomes can be avoided, most can. Thus, if MHC can find a place within the broad spectrum of international law, the use of AWS may not be associated with an accountability gap.

III. AUTONOMOUS WEAPON SYSTEMS AND THE CHALLENGE OF ACCOUNTABILITY

The course of the current debate on AWS centers on the perceived accountability gap they create.⁵³ The fact that AWS as mere machines may become tools with moral obligations is deeply problematic, and unless we can be assured that legal accountability of humans remains a possibility in the deployment of AWS and also come to terms with how any liability arising due to their use will be vicarious in nature, their use shall remain contentious and undesirable. Above everything else, without the potential of generating diffused accountability in humans, AWS will be classified as illegal weapons in themselves since without the possibility of generating liability for their

⁵³ See, e.g., DOCHERTY, *supra* note 30, at 2; Daniel N. Hammond, *Autonomous Weapons and the Problem of State Accountability*, 15 CHI. J. INT'L L. 652, 662–68 (2015); Walsh, *supra* note 14, at 1.

unlawful use or consequences, they will be deemed immune to regulation.⁵⁴

As stated earlier, accountability necessitates that all actors be held to account to pre-established standards of behavior, and should they not conform to those standards, they be held liable for all related offenses of oversight and commission and sanctions be imposed upon them. Mary Cummings in her essay on automation and accountability states that “[i]f computer systems diminish a user’s sense of moral agency and responsibility, an erosion of responsibility could result.”⁵⁵ Along similar lines as most critics of AWS, she argues that “human computer interfaces” whose actions could cause harm to individuals create “a moral buffer, a form of psychological distancing” which enables people to “ethically distance themselves from their actions.”⁵⁶ While this holds true in the case of drones as well, the distancing becomes even more pronounced and thus significantly more controversial in the case of AWS. This paper does not dispute the notion that increasing machine autonomy usually goes hand-in-hand with abdication of or at least a steady waning in the assignment and acceptance of human liability and thereby accountability. In fact, unless it is possible to define the ownership of AWS accountability, their use may be incentivized and lead to blameless episodes of senseless brutality and bloodshed. With this underlying supposition, it becomes all the more important to prove beyond doubt that in the case of AWS, the possibility of assigning accountability is genuine—or alternatively fictional—before their development and use are given a green signal along with directions for regulation.

If the possibility of accountability can be established, it will also feed into the critical care or due diligence that is necessary for bringing AWS to life, for the fear of accountability is bound to be the crucial factor that spurs individuals to employ extra care and vigilance in their roles. While this presumption of accountability being a motivation for extra care is certainly true for the human race’s social roles, does the same expectation also exist in the case of increased automation in machines? A study on the automation bias, which Linda Skitka defines

⁵⁴ See, e.g., Dan Saxon, *Autonomous Drones and Individual Criminal Responsibility*, in *DRONES AND RESPONSIBILITY: LEGAL, PHILOSOPHICAL AND SOCIO-TECHNICAL PERSPECTIVES ON REMOTELY CONTROLLED WEAPONS* 17 (Ezio Di Nucci & Filippo Santoni De Sio eds. 2016).

⁵⁵ Mary L. Cummings, *Automation and Accountability in Decision Support System Interface Design*, 32 *J. TECH. STUD.* 23, 23 (2006).

⁵⁶ *Id.*

as “a specific class of errors people tend to make in highly automated decision making contexts when many decisions are handled by automated aids (e.g. computer) and the human actor is largely present to monitor ongoing tasks,”⁵⁷ confirms that it indeed does.⁵⁸ The study shows that an increase in social accountability led to infrequent occurrences of the automation bias through a more stringent curbing of errors of omission and commission.⁵⁹ Further, the number of people involved in performing a particular task has a definite bearing on the possibility of assignment of liability. The more people in a group that are working towards a common goal, the more are the chances of accountability being diffused or not being taken as a relatively serious enough factor in decision-making processes. Cummins refers to this phenomenon as social loafing.⁶⁰ Thus, in order to ensure that individual accountability remains part of the picture, it is important to deliberately eliminate all unnecessary or non-mandatory links in the human chain involved in the decision-making processes of constructing and employing AWS.

A. POTENTIAL AVENUES OF ACCOUNTABILITY DETERMINATION: INDIVIDUALS

Since holding AWS themselves accountable due to their non-feeling, unconscious attributes is out of the question, any associated liability has to devolve on humans or states. It is the element of artificial learning in AWS that makes this difficult attribution even more complex. While in the case of any other weapon that acts in an unpredictable manner, the outcome can possibly be deemed the result of a mechanical error without accountability becoming a bone of contention, this approach cannot be assumed for AWS that are programmed with artificial intelligence which assures their users of unforeseeable outcomes. The fact that individuals deploying such systems cannot at all times remain cognizant of the outcomes professedly takes away from the establishment of a causal link between the individuals’ actions and the consequent outcomes since their control over the actions of the system progressively diminishes as it begins to survey its surroundings and take

⁵⁷ Linda Skitka, *Automation Bias*, UNIV. OF ILL. AT CHL., <https://lskitka.people.uic.edu/styled-7/styled-14/index.html> (last visited Apr. 29, 2018).

⁵⁸ Linda J. Skitka et al., *Accountability and Automation Bias*, 52 INT’L J. HUM.-COMPUTER STUD. 701, 701 (2000).

⁵⁹ *Id.*

⁶⁰ Cummings, *supra* note 55, at 26.

independent decisions relying completely on its governing algorithms with no active human input or command. However, causality is but one of the conditions of establishing accountability, others including *mens rea* and negligence, which would be relatively easier to prove in the case of AWS.

Since there is an assortment of individuals who are involved in the development and employment of AWS, such as weapon designers, programmers, and military commanders, accountability may be distinctly possible. However, critics of AWS have highlighted the failings of these personal liability approaches towards accountability.⁶¹ Among the forms of individual responsibility that may be considered, command responsibility rests on the presumption of the negligence of the commander(s) who authorized the deployment of an autonomous weapon that commits an illegal act. Along with this approach to liability, command responsibility may even be sought on the grounds of strict liability, which allows liability attribution even without the grounds of intent or negligence being established so long as it can be proven that the defendant knew or should have known of the nature of the outcome(s) of her actions, though that path may be precarious considering that it would be rare for just one military officer to be involved in the stationing of an autonomous weapon on the ground. On the contrary, it is likely that numerous officers will be interested participants in the deployment of a weapon and thus it would be complicated to determine how far down in the chain of command one must go to ascribe liability and impute accountability. Overall, individual criminal responsibility demands the presence of *mens rea* or negligence before criminal liability can be ascribed to an individual. This paper shall in its fourth section elaborate further on the attribution of individual criminal responsibility for the unlawful consequences of AWS actions.

B. CORPORATIONS

Next, though not as extensively discussed in this regard, the liability of corporations that are involved in manufacturing AWS or their programmes has also gained some attention. In the usual scheme of things, as long as a certain type of weapon is considered lawful and its production is ordered by a legitimate entity, corporate responsibility does not pose any contentious issues. Particularly when the manufacturing

⁶¹ Hammond, *supra* note 53, at 664.

corporation meets the legal conditions that the acquiring agency—as long as it is a legitimate entity authorized to acquire such weapons—specified at the time of placing the order, the manufacturing corporation is practically absolved from any liability it may otherwise have had to bear.⁶² Additionally, at least one court in the United States has held that the manufacturers of a weapon do not have any duty of care towards enemy combatants or persons associated with enemy forces and the consequences of the use of weapons during wartime confrontations cannot give rise to any manufacturer liability in tort for faulty products.⁶³ Thus as a general rule, corporations are not subject to liability in the legitimate use of weapons. However, corporations do not remain unaffected by criminal accountability under international law. There has been a spate of cases through which transnational corporations have been challenged and sued for human rights abuses.⁶⁴ In fact there are many treaties such as the European Convention on the Prevention of Terrorism (2005)⁶⁵ and the United Nations Convention against Transnational Organized Crime (2000)⁶⁶ that recognize the criminal, civil, and administrative liability of all legal persons, including entities such as corporations. However, the criminal responsibility of corporations is not a universally accepted concept. Many states have imposed limitations on the criminal responsibility of corporations marking this liability route as better served when it is pursued over individuals.⁶⁷ Neither is corporate civil liability an arena often resorted to in discussions on accountability of AWS, since traditional product liability—wherein the manufacturer of a product is held liable for its shortcomings—is based on the assumption of a product whose conduct and consequences of use are foreseeable. This predictability is missing in AWS as they are given to artificial learning on-the-go and thus the legal standards usually associated with product liability are not present in their case. It may be easier to attach

⁶² Boyle v. United Techs. Corp., 487 U.S. 500, 510 (1988).

⁶³ Koohi v. United States, 976 F.2d 1328, 1336–37 (9th Cir. 1992).

⁶⁴ See, e.g., Doe v. Unocal Corp., 395 F.3d 932, 939–42 (9th Cir. 2002); Union Carbide v. Union of India, (1991) SCR Supl. (1) 251; *Shell Petroleum Development v. Farah*, CHILD RIGHTS INT'L NETWORK, <https://www.crin.org/en/library/legal-database/shell-petroleum-development-company-ltd-v-councillor-fb-farah-and-others> (last visited Mar. 18, 2018).

⁶⁵ Council of Europe Convention on the Prevention of Terrorism, art. 10, May 16, 2005, 16.V.2005 No. 196.

⁶⁶ G.A. Res. 55/25, art. 10, United Nations Convention against Transnational Organized Crime (Nov. 15, 2000).

⁶⁷ E.g., German law does not make provision for imposition of criminal liability on corporations. France too follows a relatively restrictive system of corporate criminal liability.

corporate responsibility when the lines of AWS defects in terms of construction (as against outcomes) are clearly attributable to their manufacturers, such as when there is an obvious fault in the design of a system that renders it vulnerable to malfunctioning making it illegal fundamentally; or when a corporation commissions the sale of AWS to entities even when it is illegal to supply such weapons to those parties and when such conduct is against the international obligations of the state in which the aforesaid corporation is based. At any rate, imposition of corporate accountability with regard to AWS is a challenging hypothesis that merits further discussion in the forthcoming parts of this paper.

C. STATES

Finally, the prospect of state responsibility⁶⁸ is also one worth considering even though when one comes to think of its feasibility, surrounded by the only two possibilities of pursuing it either at the International Court of Justice (ICJ) or in a domestic court, one begins to question if it is indeed a practical option.⁶⁹ State responsibility is best defined by Articles 1⁷⁰ and 2⁷¹ of the International Law Commission's Draft Articles on the Responsibility of States for Internationally Wrongful Acts (2001). Article 2 of the Draft Articles defines an "internationally wrongful act of a state" as including an act or omission that can be assigned to the state under the aegis of international law and which by itself comprises a violation of an "international legal obligation" of the state.⁷² It is pertinent to note here the content of Article 1 of the Draft Articles, which states "[e]very internationally wrongful act of a State entails the international responsibility of that State."⁷³ This basis of state responsibility in these Draft Articles, which is not conditional on the verification of any other prerequisites, is straightforward enough. Granted that a state cannot conduct acts of its

⁶⁸ Since "state responsibility" is an established term in the law, the text of this paper shall use 'state responsibility' to refer to "state accountability."

⁶⁹ Hammond, *supra* note 53, at 677, 681.

⁷⁰ Rep. of the International Law Commission on the Work of its Fifty-Third Session, U.N. Doc. A/56/10, at 32 (2008), http://legal.un.org/ilc/texts/instruments/english/commentaries/9_6_2001.pdf [hereinafter Draft Articles].

⁷¹ *Id.* at 34.

⁷² *Id.*

⁷³ *Id.* at 32.

own from the viewpoint of innate causality and must have an agent or a group of agents whose actions can be ascribed to it and that those actions have to be further characterized as ‘internationally wrongful acts,’ the use of the theory of attribution in determining state responsibility is fundamental. Each state is bound by its obligation to uphold IHL, and the conduct and determinations of a state’s nationals are compulsorily attached to a state’s IHL obligations. This premise is apt for the justification of pursuing state responsibility in cases of legal violations that may result from the use of AWS. Thus, even if we were to seek other sources of accountability such as commander responsibility, it may still be possible to pursue the course of a state’s simultaneous liability. Even if an individual is found guilty of the crimes committed by AWS, the state nonetheless remains inextricably attached to its obligation to sustain IHL.

The pursuit of state responsibility has a limited number of outlets. The punitive aspect of liability is fundamentally absent from this structure, and other than through alternative negotiation-based diplomatic courses, it is largely by making the state responsible for reparations that state responsibility may be pursued. It is interesting to note that this spotlight on reparations in international law is relatively recent.⁷⁴ For a very long time, the veil of state sovereignty reigned supreme and could not be pierced.⁷⁵ The rights of individuals against states was not a welcome concept, and states remained unwilling to provide any space for the idea of victims’ rights to establish itself. All the same, the brutality of the acts witnessed during the Second World War was such that unprecedented remedies were sought to redress the grave violations that had been committed. The Nuremberg and Tokyo Trials that were the outcomes of this period of history were the first instances when the privilege of the state to remain immune was dismissed in favor of something far greater—remedying human rights violations.⁷⁶ From its roots in the period after the Second World War, the concept of state responsibility has not just evolved but also gained greater authority by being recognized in various international human rights treaties and

⁷⁴ See, e.g., Ta-Nehisi Coates, *The Case for Reparations*, THE ATLANTIC (June 2014), <https://www.theatlantic.com/magazine/archive/2014/06/the-case-for-reparations/361631>; Richard M. Buxbaum, *A Legal History of International Reparations*, 23 BERKELEY J. INT’L L. 314, 319 (2005).

⁷⁵ See Mark S. Ellis & Elizabeth Hutton, *Policy Implications of World War II Reparations and Restitution as Applied to the Former Yugoslavia*, 20 BERKELEY J. INT’L L. 342, 342 (2002).

⁷⁶ *Id.*

conventions, including the Universal Declaration of Human Rights (1948) and the International Covenant on Civil and Political Rights (1966).

Another contentious form of state responsibility may be sought via the means of establishing tort liability. Tort recovery against individuals and governments has been steadily gaining stage particularly after the Second World War. For example, victims of Japanese human rights violations and abuses approached Japanese courts to seek redress.⁷⁷ Pursuing tort liability makes it possible for victims of international crimes to seek compensation for damages caused, a prospect unavailable to them under international criminal law. In the case of human rights violations that can be attributed to the use of AWS, a state's non-contractual, tortious liability to individuals is another avenue to pursue, though traditionally tort law has been the prerogative of domestic law. Tortious liability of the state also has its basis in Article 35 of the Draft Articles through which it is derivable that the absence of illegality in an action does not preclude a state from having to compensate any victims for the illegal repercussions of an action which may be lawful in itself.⁷⁸ This is particularly relevant for the purpose of this dissertation since regardless of the legality or illegality of the deployment of AWS, it remains possible to hold states responsible to compensate victims for the unlawful injuries caused due to their use.

This calls for ironing out the accountability question before any further technological or non-technological progress is made with respect to AWS so as to make the above forms of accountability attribution actually realizable as avenues of AWS regulation. This paper will include more extensive commentary on the potentiality of an accountability regime for AWS in the next section.

IV. THE CHALLENGE OF HOLDING AUTONOMOUS WEAPON SYSTEMS ACCOUNTABLE: IS THE PURPORTED ACCOUNTABILITY GAP ABSOLUTE AND INSURMOUNTABLE?

Accountability debates in the context of weapons involving new technology are not new. The advent of remote-controlled and semi-

⁷⁷ Kenneth Bullock, *United States Tort Liability for War Crimes Abroad: An Assessment and Recommendation*, 58 *LAW & CONTEMP. PROBS.* 139, 139 (1995).

⁷⁸ Draft Articles, *supra* note 70, at 96.

autonomous systems had already spurred discussions on accountability; the only difference then was the relative ease with which liability could be attributed to humans. Ultimately it was a question of fact to determine who set off or remotely triggered an armament or who gave the command to issue a semi-autonomous weapon in a territory. In the case of AWS, while the substance of associated dialogue is largely the same, the answers sought by experts are overtly complex. This category of weapons—distinguished by an in-principle *elimination* of continued human control over the weapons' actions—calls our attention to the unlikelihood of the possibility to hold any human at least *literally* responsible for the consequences of the use of such weapons. As considered in the previous sections, even as continuous direct human control will continue to evade AWS, which in a sense is their unique strength as well as disadvantage depending on the side from which one is considering them, MHC remains a distinct possibility as long as the concept can be established solidly in the realm of international law. If it can be so conceded, MHC can be the contemporary standard with the help of which AWS will find a place in international law. Or not.

In this paper, we have already summarily touched upon the potential accountability avenues that may be available to prosecute crimes perpetrated by AWS. In the following pages, we will analyze if any of the possible options serves the purpose by ensuring accountability and closing the purported gap, keeping in mind that there is general consensus over the futility of holding AWS themselves accountable for their actions, a course of action that would indeed defeat the motivation of criminal law *in toto*.⁷⁹ That said, in some jurisdictions, there have been developments relating to furnishing legal personality on non-humans, such as lands and rivers,⁸⁰ and there indeed is a relationship between assignment of legal personality and accountability attribution (a discussion that is beyond the scope of this paper).

⁷⁹ See, e.g., Crotoof, *supra* note 14, at 53; Walsh, *supra* note 14, at 1.

⁸⁰ See Devon O'Neil, *Parks are People Too*, OUTSIDE (Aug. 3, 2016), <https://www.outsideonline.com/2102536/parks-are-people-too>; Bryant Rousseau, *In New Zealand, Lands and Rivers Can Be People (Legally Speaking)*, N.Y. TIMES (July 13, 2016), <https://www.nytimes.com/2016/07/14/world/what-in-the-world/in-new-zealand-lands-and-rivers-can-be-people-legally-speaking.html>.

A. INDIVIDUAL CRIMINAL ACCOUNTABILITY

1. Programmer or Designer

The determinations made by AWS in conflict zones would depend on their in-built artificial intelligence. When AWS violate IHL, their actions cannot be considered technical failures which they could be in the case of another computerized system, and thus the liability for their errors is not as easy to direct to their programmers or developers as it would be otherwise. Launching such systems in dynamic environments that change very rapidly will involve decisions of a kind that would be impossible for a programmer to foresee and make provision for. However, it is not only the machine learning aspect of AWS that is problematic here. It is also the fact that AWS are bound to have extremely intricate programmes that would involve teams of people and not just one person developing them, and as stated previously, the more people involved the more likely are the chances of it being even more difficult to pin accountability. Punishing an individual for an unintended action vicariously in the context of AWS is problematic. For instance, the *Pinkerton* decision⁸¹ in the United States established the reasonable foreseeability requirement as a due process prerequisite for establishing vicarious criminal liability, and the use of AWS is expected to lead to unforeseeable outcomes. Therefore the assignment of vicarious liability apropos use of AWS goes against a due process canon of criminal law in at least one prominent jurisdiction. Another legal argument against holding programmers liable for AWS actions is that criminal law, including international criminal law,⁸² requires the presence of the mental element if guilt is to be established. However by making intent (*dolus directus*) a prerequisite, the law of the International Criminal Court (ICC) does not recognize the potential of *dolus indirectus*⁸³ and *dolus eventualis*⁸⁴ in assuring justice.

⁸¹ *Pinkerton v. United States*, 328 U.S. 640, 647–48 (1946).

⁸² Rome Statute of the International Criminal Court art. 30, July 17, 1998, 2187 U.N.T.S. 3 [hereinafter Rome Statute].

⁸³ *Dolus indirectus* recognizes the ancillary consequences that result from an action, which are additional to the dominant ones and which had not been the motivation of the executor of an action. See Jens D. Ohlin, *Targeting and the Concept of Intent*, 35 MICH. J. INT'L L. 79, 104 (2013).

⁸⁴ *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 many common law countries, *dolus eventualis* is not recognized as negligence but instead as recklessness,⁸⁵ yet the distinction between the two is not so manifest in criminal law outcomes. However, such wrongdoing is not within the mandate of the ICC to try as its jurisdiction is confined to only “the most serious crimes of international concern to the international community as a whole.”⁸⁶ While the ICC concerns itself only with crimes that require maximal *dolus*, it is not incautious to presume that if there is consensus on the issue, the international community may devise other fora whose jurisdiction—while not in conflict with the ICC’s—does cover crimes that result from *dolus eventualis* and considers them as international war crimes that necessitate assignment of liability.

In the use of AWS, if a crime can be proven to be the result of *dolus directus*, there is little discomfiture over accountability. However, it is understandable that most undesirable consequences emanating from AWS will not be the outcomes of *dolus directus*. Instead they will result from a comparatively diluted degree of *dolus*. Nonetheless, it will still be possible to characterize all outcomes as the results of *dolus eventualis* which is enough to justify criminal prosecutions in many domestic criminal systems. Internationally too, it may be possible to hold programmers and other individuals accountable for the crimes perpetrated by AWS as long as the damage they cause cannot be defined as collateral and it remains excessive categorically. But above all, there would have to be a good degree of agreement on *dolus eventualis* being a form of acceptable intent. Further, to deal with the problematic issue of a large group of individuals being involved in developing the algorithms for AWS, an antecedent step to determining accountability will involve establishing the link of causality by extracting out of a group of programmers the one(s) directly and/or most responsible for the programming that led to the machines’ rogue actions in the field.

2. *Military Personnel (Commander or Operator):*

Command or superior responsibility rests on the tenet that an individual who commanded the execution of an action remains vicariously responsible for it regardless of the fact that she provided no

⁸⁵ See Ohlin, *supra* note 83, at 88–89.

⁸⁶ Rome Statute, *supra* note 82, art. 30.

practical or direct assistance in the perpetration of the crime.⁸⁷ A commander's liability in the context of AWS includes operator liability. While the superior's duty is not so much active, it is a kind of liability that arises from violating the duty to prevent the illegal actions of a party, actions over which the superior exercises professional control.⁸⁸ While in the case of use of AWS, command responsibility does evoke a sense of usefulness, several conditions must be fulfilled before it can be successfully applied and the accountability of a military commander recognized. Considering that the commander is not personally culpable under criminal law, the degree of her liability is also of a diluted form. The first step to establishing superior responsibility is to confirm that a commander's subordinates are criminally responsible for their actions that are the outcomes of the commander's orders or her active or passive agreement. The commander's knowledge of the commission of a crime and her competence and influence to thwart it and punish her subordinates are essential to prove command responsibility.⁸⁹ Further, the *dolus* requirements as defined in the case of AWS programmers also have to be met if command responsibility is to be established. The challenges associated with proving this form of accountability—as long as it is accomplice liability we are looking at—are relatively more arduous than those valid for confirming individual responsibility in criminal law.

The second form of command responsibility may be proven if it sufficiently meets the “should have known” yardstick. Commanders can be held responsible for those violations of international law which they would be reasonably expected to have known about even if they had no role to play in favorably instigating or overlooking violations committed by AWS.⁹⁰ The United States Supreme Court recognized this standard in its *Yamashita* decision, which involved the Second World War trial of General Yamashita of Japan.⁹¹ The Court decided that the perpetration of atrocities on Filipinos by the Japanese armed forces was so extensive that

⁸⁷ Guénaél Mettraux, *Command Responsibility in International Law – The Boundaries of Criminal Liability for Military Commanders and Civilian Leaders* 14 (Jan. 2008) (unpublished Ph.D. thesis, London School of Economics) (on file with the London School of Economics).

⁸⁸ *Id.* at 15.

⁸⁹ Bakone Moloto, *Command Responsibility in International Criminal Tribunals*, 3 BERKELEY J. INT'L L. PUBLICIST 12, 13–14, 16–17 (2009).

⁹⁰ Geoffrey S. Corn, *Autonomous Weapon Systems: Managing the Inevitability of “Taking the Man out of the Loop,”* in AUTONOMOUS WEAPONS SYSTEMS: LAW, ETHICS, POLICY 209 (Nehal Bhuta et al., eds., 2016).

⁹¹ See *In re Yamashita*, 327 U.S. 1, 15–16 (1986).

General Yamashita, as the commanding officer of the Japanese forces, should have known about them and even if he did not, that he remained responsible for them.⁹² This is a widely contentious decision. However, the fact that this standard has been applied to validate command responsibility shows that, even though formidable to prove, this avenue remains available in the context of crimes committed at the hand of AWS.

Geoffrey Corn also makes another distinct point on command responsibility by elucidating how it could be shifted to the procurement officials who bring AWS into a government's inventory. This shift would ensure that "decision-making officials and not technicians or legal advisers" and the ones who endorse the developing technological know-how of AWS are the individuals who are held accountable should any unlawful outcomes result.⁹³ This shift in accountability, according to Corn, will ensure the highest levels of confidence in a product before it is released to the customer and particularly establish that a weapon is international law-compliant before it is absorbed into a national defense system.⁹⁴ While I concur with his proposition to introduce this additional layer of accountability of procurement agents to make AWS-related scrutiny more thorough by covering individuals who should be among those most invested in following the dictates of law, I do not think that his recommendation necessarily warrants a shift. A system that pursues multiple levels of even one kind of accountability—in this case command responsibility—has the potential to be a more authoritative and dependable system that goes after accountability at multiple levels of human involvement and thus helps in the narrowing of any purported accountability gap.

B. CORPORATE ACCOUNTABILITY

In present-day discussions on accountability in the context of AWS, corporate liability is often called manufacturers' liability.⁹⁵ In some jurisdictions, it is possible for claimants to file product liability cases in civil fora for injuries caused by the products manufactured or

⁹² See generally *id.*

⁹³ Corn, *supra* note 90.

⁹⁴ *Id.*

⁹⁵ See Neha Jain, *Autonomous Weapon Systems: New Frameworks for Individual Responsibility*, in *AUTONOMOUS WEAPONS SYSTEMS: LAW, ETHICS, POLICY* 303, 321 (Nehal Bhuta et al. eds., 2016); Hammond, *supra* note 53, at 665–67.

supplied by corporations. These injuries may result from the design of an article and/or blueprint or production-related defects and involve various forms of negligence, including manufacturer shortcomings in providing the necessary use and care guidance with a product. Formally instating corporate accountability in the context of AWS has its obvious advantages, the least of them being the installation of an additional layer of inspection and care to ensure the manufacturing of high quality, international law-compliant weapons. It is important to note here that corporations cannot be held to account over failures of individuals and states to use AWS in ways that conform to the extant dictates of law as long as the design and production of the weapons are lawful.⁹⁶ Further, if a manufacturer informed the buyer of a product about the possibility as well as nature of impairments that may occur while the product is being used, it becomes difficult, perhaps even impossible, to establish negligence and avail the ground of product liability to file a suit based on manufacturer responsibility.⁹⁷ Although civil cases in this class of accountability would be difficult to maintain also since the victims are more or less defenseless in the face of the resources and power of big corporations, their possibility cannot be negated.

The criminal prosecution of corporations is wrought with even more challenges. Most of the international criminal law institutions, including the ICC, have their jurisdiction applicable only to natural persons. International law is known to be rather hesitant in asserting criminal liability of corporations even though top management officials of corporations have been implicated in the past in their individual capacities for the production of tools that perpetuated the commission of war crimes and have been held criminally accountable as such.⁹⁸

C. STATE RESPONSIBILITY

Having states involved in the accountability paradigm associated with AWS should ideally be one of the most favorable options as this would ensure that the highest authority in a territory has the stimulus to

⁹⁶ Boyle v. United Techs. Corp., 487 U.S. 500, 512 (1988).

⁹⁷ See generally *id.* Even if this is an example of US domestic law, it does exemplify the kind of arguments that can be used in other jurisdictions to restrict manufacturer liability. It also goes on to show that instituting civil suits against non-domestic manufacturers may prove to be even more difficult.

⁹⁸ Matthew Lippman, *War Crimes Trials of German Industrialists: The Other Schindlers*, 9 TEMP. INT'L & COMP. L.J. 173, 178–80, 254 (1995).

keep itself in congruence with the decree of law while employing the highest standards of diligence and care in the acquisition or production and use of AWS. Moreover, there would also be consistent debate over the desirability of AWS application on a case-by-case basis if the cost of potential violations were high enough to invite state responsibility. The introduction of state responsibility in the AWS regulation regime will also ensure tighter controls on all the parties involved in the design, production, and use of AWS as states are likely to install their unique checklists to ensure that their AWS are veritably well-equipped to pass the criteria laid down by international law for a lawful weapon and that their use is also in conformity with law. It is only right that so much be expected of the state in terms of responsibility and that the degree of its liability be higher than that of related individuals who are actually only answering to the weapon requisition requests of their respective states (unless their actions are supported by a personal *dolus* that is not in consonance with the state's motivations).⁹⁹

State responsibility for violations attributable to the use of AWS can be pursued in multiple fora—the ICJ, if the victim's/victims' state chooses to bring a case against the offending state and if all the jurisdiction-related and other conditions are fulfilled, or domestic courts.¹⁰⁰ However, the possibility of initiating proceedings against another state at the ICJ is full of jurisdiction-related complications which are prone to deadlocks.¹⁰¹ Further, without its own enforcement mechanism and with the Security Council proving to be a less than dependable enforcement ally, the ICJ remains a possible and plausible avenue to pursue accountability though not an entirely probable one. Similarly with domestic courts, the option of access by individual or groups of victims for bringing offending states to trial remains open though highly limited considering the entrenched inequalities between the parties in terms of power, resources, etc. Victims are also likely to have extensive difficulty in determining the appropriate court that will have jurisdiction over an associated grievance. Whether it is a claim under criminal law or tort law and whether it would involve the piercing of a state's veil of sovereign immunity are all pertinent questions that

⁹⁹ See Hammond, *supra* note 53, at 681–84.

¹⁰⁰ Aloysius P. Llamzon, *Jurisdiction and Compliance in Recent Decision of the International Court of Justice*, 18 EUR. J. INT'L L. 815, 815–16 (2007); S. Gozie Ogbodo, *An Overview of the Challenges Facing the International Court of Justice in the 21st Century*, 18 ANN. SURV. INT'L & COMP. L. 93, 97, 98 n.31 (2012).

¹⁰¹ Llamzon, *supra* note 100, at 817.

require answers before an individual or group of victims aggrieved by the actions of AWS can determine their legal approach. Thus, in a strict sense, domestic courts would remain available as fora where related claims could be pursued. However, it is harder to affirmatively confirm if they would be viable options for victims who mostly would be caught in the rigmarole of legal technicalities and mounting expenses. It is possible that states would favor compensating victims under tort action instead of accepting liability for war crimes, and thus prefer victims going after tort remedies—under both strict liability and negligence liability—over the pursuit of criminal accountability. This is another course that is under the aegis of state responsibility that could preserve accountability.

V. CONCLUSION

Some scholars deem the accountability gap associated with AWS fictional for a number of reasons. There are those who find the use of the term ‘fully autonomous’ for such weapons a terminological aberration as all weapon systems, even those characterized as autonomous, require human involvement to be put in motion initially.¹⁰² Overall and as has been evinced in the previous sections of this paper, accountability remains possible in the context of AWS even though its attribution is more complicated than it is in the case of illegal consequences that result from the actions of other kinds of weapons.

AWS are unique in that, even though none are known to have been used thus far, there is enough known about them already to draw diverse voices into extensive debates over their desirability from the deontological, consequentialist, and legal points of view. Further, there continues to be considerable examination of the possibility of their statutory compliance. In fact, I believe this is an ideal state of affairs as we are able to devote significant attention and time to analyzing this new category of weapons before they come into being. This helps ensure that we are still speaking in terms of prevention, safeguards, and even corrections, and not simply apropos damage control and prohibitions.

This paper demonstrates that subsisting laws are enough as is and can be interpreted innovatively to ensure the possibility of accountability in the context of AWS, even though attribution is not

¹⁰² Jean-Baptiste Vilmer, *Terminator Ethics: Should We Ban “Killer Robots?”*, ETHICS & INT’L AFFAIRS (Mar. 23, 2015), <https://www.ethicsandinternationalaffairs.org/2015/terminator-ethics-ban-killer-robots/>.

going to be easy and will need to be determined on a case-by-case basis. Thus, both the regulation of AWS and the accountability for their illegal use or faulty development and production remain *roughly* possible. But are these avenues of assigning liability and seeking relief practical? As demonstrated in section IV, they are actually anything but straightforward. Most of the approaches to accountability listed in this paper call for innovative interpretations of laws and more wherewithal from relief seekers than they can usually muster, especially if they are individuals or groups of victims. This defeats the purpose of human rights law and justice for both have to be easily accessible by the most vulnerable. While it is important to note that there is no need to subject the development and use of AWS to a more rigorous legal regime than what is applicable to human combatants or states—because accountability even in the case of AWS is going to ultimately devolve on humans or states—it is important for states to consent to negotiating an additional legal framework that draws on various aspects of law to specifically regulate AWS. The previous sections of this paper demonstrate that more than one type of accountability is conceivable in the existing legal regime applicable to AWS, which may give the impression of an accountability safety net. But any such impression is likely to be a false one because not one of the avenues listed is conveniently employable.

The self-determining will of AWS is not a weapon characteristic that the world has had to confront before, and dialogue on accountability for AWS actions has been negatively influenced by the consternation associated with the nature of these weapons—and not without reason. A couple of years ago, I wrote an opinion piece advocating for the regulation of AWS.¹⁰³ My tone in that piece is buoyant as I recommend the engineering of a new legal framework to regulate the use as well as the production, distribution, and accumulation of AWS.¹⁰⁴ However, as I began to learn more about AWS, my stance in relation to the accountability question associated with their design, manufacture, and use did not change as much as the feeling of trepidation I associate with AWS' advent augmented. There is indeed tremendous potential in technology to make conflicts safer and less gory for all as well as to

¹⁰³ Swati Malik, *Autonomous Weapons Systems: The Urgent Need for Regulation*, GLOBAL POL'Y (Jan. 19, 2015), <http://www.globalpolicyjournal.com/blog/19/01/2015/autonomous-weapon-systems-urgent-need-regulation>.

¹⁰⁴ *Id.*

change the nature of weapons used in armed conflicts. However, this potential can only be exploited as long as we can make a commitment to adequately regulating new weapons. As discussed in the early parts of this paper, the ongoing proposals in the current context include enforcing a ban, imposing a moratorium, using existing law to ensure regulation, and introducing new AWS-specific legislation. While commenting on each aspect of AWS that is deemed problematic by critics is beyond the scope of this paper, my review has led me to understand that their autonomy is not precarious from the standpoint of international law. Nevertheless, their materialization may indeed cause an accountability gap, however one that is bridgeable with the innovative application of the laws that we have now or better still with the introduction of new, more refined and pertinent ones.