

Autonomous Weapons, War Crimes, and Accountability

Jason Lee

INTRODUCTION

Many nations and their respective militaries are actively developing and deploying autonomous weapon systems equipped with artificial intelligence.¹ The most advanced version of these systems is the “lethal autonomous weapon systems” or LAWS, which utilizes onboard “sensor suites and computer algorithms” to independently identify . . . engage and destroy the target[s] without manual human control of the system.”² Although LAWS are not fully mature in many parts of the world, some nations such as “Israel, Russia, South Korea, and Turkey have reportedly deployed weapons with autonomous capabilities” that that can be categorized as LAWS,³ and other nations such as Australia, Britain, China, and the United States are investing extensively in the development of LAWS platforms.⁴ Moreover, with the recent on-the-ground exhibition of various unmanned weapon systems in Ukraine, it is likely that the development of LAWS around the globe will only be exacerbated in the coming years⁵ as neither the United States nor the rest of the world “prohibit the development or employment of LAWS.”⁶

This trend in the development of LAWS has led to a series of moral and legal concerns regarding these systems’ potential violation of international humanitarian law in action.⁷ It has led to questions over

¹ Robert F. Trager & Laura M. Luca, *Killer Robots Are Here—and We Need to Regulate Them*, FOREIGN POL’Y (May 22, 2022, 1:46 PM), <https://foreignpolicy.com/2022/05/11/killer-robots-lethal-autonomous-weapons-systems-ukraine-libya-regulation/> [https://perma.cc/9EVZ-WV6L].

² KELLEY M. SAYLER, CONG. RSCH. SERV., IF11150 DEFENSE PRIMER: U.S. POLICY ON LETHAL AUTONOMOUS WEAPON SYSTEMS 1 (2023) [hereinafter CRS Report].

³ See Zachary Kallenborn, *Applying Arms-Control Frameworks to Autonomous Weapons*, THE BROOKINGS INST. (Oct. 5, 2021), <https://www.brookings.edu/techstream/applying-arms-control-frameworks-to-autonomous-weapons/> [https://perma.cc/U3JA-MV2A].

⁴ Trager & Luca, *supra* note 1.

⁵ See Frank Bajak & Hanna Arhirova, *Drone Advances in Ukraine Could Bring Dawn of Killer Robots*, AP NEWS (Jan. 3, 2023, 5:07 PM), <https://apnews.com/article/russia-ukraine-war-drone-advances-6591dc69a4bf2081dcdd265e1c986203> [https://perma.cc/NY6E-57QC].

⁶ SAYLER, *supra* note 2, at 1.

⁷ See Thompson Chengeta, *Accountability Gap: Autonomous Weapons Systems and Modes of Responsibility in International Law*, 45 DENV. J. INT’L L. & POL’Y 1 (2016); Rebecca Crootof, *War Torts: Accountability for Autonomous Weapons*,

whether the decision to kill human targets should be left entirely to a machine and – closer to the topic of this paper – whether and how any being could be held accountable should such autonomous decision-making platforms produce conduct that may constitute a “war crime” under the International Humanitarian law. And in particular, the issue of the “accountability gap” remains largely unresolved with no clear domestic or international regulatory development matching the rate of development of artificial intelligence around the globe.

This paper seeks to analyze the issue of the “accountability gap” and LAWS from a whole new point of view—the Outer Space Treaty. The first section will begin by establishing the unsettled “definition” of an autonomous weapon system in the context of international law. Then the paper explains the two most prominently studied areas of international humanitarian law—the rules of distinction and proportionality—as well as how the deployment of LAWS may create an accountability gap in active conflict zones and how existing legal frameworks are ill-equipped to address legal questions arising out of the conduct of LAWS. Finally, reflecting upon the text and actual implication of the Outer Space Treaty, this paper will suggest that a new treaty should be explored in order to implement a controlled development of artificial intelligence and nonproliferation of boundless development of LAWS.

Although the complete prohibition of further development of LAWS would be an easy and swift solution, such a remedy is highly unrealistic and will face a tremendous amount of backlash. Furthermore, the abundant potential of artificial intelligence to improve life cannot be ignored.⁸ As history has shown us, many technological marvels we enjoy

164 U. PA. L. REV. 1347 (2016); Neil Davison, *A Legal Perspective: Autonomous Weapon Systems Under International Humanitarian Law*, in U.N. OFF. FOR DISARMAMENT AFFS, PERSPECTIVES ON LETHAL AUTONOMOUS WEAPON SYSTEMS, U.N. Sales No. E.17.IX.6 (2018); Carrie McDougall, *Autonomous Weapon Systems and Accountability: Putting the Cart Before the Horse*, 20 MELBOURNE J. INT’L L. 58 (2019); Ilse Verdiesen et al., *Accountability and Control Over Autonomous Weapon Systems: A Framework for Comprehensive Human Oversight*, 31 MINDS & MACHINES 137 (2021).

⁸ The benefits of artificial intelligence in human life are limitless. Its ability to increase efficiency and reduce error can be applied to various industries such as health care, automotive, aviation, and other important industries. It can improve user experience in transportation, travel, and e-commerce by utilizing vast data it can accumulate and analyze. See Anurag Gurtu, *Five Industries Reaping the Benefits of Artificial Intelligence*, FORBES (Jun. 2, 2021, 9:10 AM), <https://www.forbes.com/sites/forbestechcouncil/2021/06/02/five-industries-reaping-the-benefits-of-artificial-intelligence/?sh=5ef3161f59ca> [https://perma.cc/E3JX-5AXA]; Jake Frankenfield, *Artificial Intelligence (AI): What It Is and How It Is Used*, INVESTOPEDIA (Dec. 4, 2023), <https://www.investopedia.com/terms/a/artificial-intelligence-ai.asp> [https://perma.cc/RTP8-KN4C]; see also Pooja Choudhary, *Top 10 Benefits of AI in the Real Estate Industry*, AI THORITY: AI TECH. INSIGHTS (Dec. 3, 2023),

today—from duct tape to GPS systems—were originally developed for military applications.⁹ What halted the nations from developing space-based missile systems from communication satellites was the existence of an international framework like the Outer Space Treaty. The creation and ratification of similar treaties addressing artificial intelligence and their weaponization will certainly eliminate the “accountability gap” that could arise from increasing usage of LAWS in combat zones of today and future.

The purpose of this paper is not to offer a “grand solution” to the existing problem, but to highlight the fact that the international community has confronted the dangers of unregulated technological development in the past. Born amid the nuclear age, the Outer Space Treaty offered a robust foundation on which nations could navigate in each of their own searches for new technological frontiers. Some may argue that certain international measures such as treaties are difficult and imperfect ways to address the ongoing issue.¹⁰ Of course, this paper does not seek to offer the *perfect* solution or even suggest that any international measure would be the flawless tool to address the issue at hand. However, if a new treaty—which emulates something that succeeded in the past—can prevent innocent victims of war caused by LAWS and, more importantly, help victims of war crimes escape the endless loop of accountability gaps, it should be actively sought after and implemented.

I. THE DEFINITION OF AUTONOMOUS WEAPON SYSTEMS

The state of being “autonomous” certainly has varying implications depending on the field of application. The dictionary definition refers to possession of the “right or power” to “self-govern[.]”¹¹ “Autonomy” or “autonomous” state in political science refers to the legal “power of communities to exercise public policy functions . . . independently of other sources of authority.”¹² More applicable to the topic of this article, the term “autonomous” as it is used in robotics may refer to a robot that can make

<https://aithority.com/robots/automation/top-10-benefits-of-ai-in-the-real-estate-industry/> [<https://perma.cc/2YXQ-XWDP>].

⁹ See Christopher McFadden, *9 Military Spin-Off Technologies We Use Almost Everyday*, INTERESTING ENG’G (Jun. 7, 2020, 8:06 AM), <https://interestingengineering.com/innovation/9-military-spin-off-technologies-we-use-almost-everyday> [<https://perma.cc/9SKJ-HSB4>].

¹⁰ See, e.g., GREG ALLEN & TANIEL CHAN, ARTIFICIAL INTELLIGENCE AND NATIONAL SECURITY 67 (2017); see also Steven J. Hoffman, et al., *International Treaties Have Mostly Failed to Produce Their Intended Effects*, 119 PNAS 1, 5-6 (2022).

¹¹ *Autonomous*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/autonomous> [<https://perma.cc/6MJD-ULLK>] (last visited Apr. 1, 2023).

¹² Stefan Wolff, *Autonomy*, ENCYCLOPEDIA PRINCETONIENSIS, <https://pesd.princeton.edu/node/236#:~:text=Autonomy%20is%20the%20legally%20entrenched,legal%20order%20of%20the%20state> [<https://perma.cc/98MQ-P7VD>] (last visited Apr. 1, 2023).

its own decisions and perform actions accordingly by assessing its surrounding environment.¹³

When it comes to weapon systems, the international debate over what constitutes “autonomous” has been ongoing for years¹⁴ and the definition remains unsettled. Much of the debate circles around “what extent” of human intervention is involved and the extent of independence the system has in its operation.¹⁵ As many weapon systems become sophisticated and computerized, the line between automated and autonomous systems becomes blurrier. For instance, the AEGIS Weapon System¹⁶ onboard many combat ships around the world, including those of the United States, is a “centralized, automated” system designed to coordinate the command and decision process “from detection to kill.”¹⁷ The system integrates a very powerful SPY-1 radar and missiles to track and kill over 100 targets at more than 100 nautical miles from the mothership.¹⁸ Although the system supplements human elements in significant ways and can “theoretically . . . operate fully autonomously,”¹⁹ making threat assessments using onboard computer software, whether such a highly-

¹³ See Jason Walker, *What Are Autonomous Robots? 8 Applications for Today's AMRs*, LOCUS ROBOTICS, <https://locusrobotics.com/what-are-autonomous-robots/> [<https://perma.cc/S9BQ-V5DD>] (last visited Apr. 1, 2023).

¹⁴ See Gregory C. Allen, *DOD Is Updating Its Decade-Old Autonomous Weapons Policy, but Confusion Remains Widespread*, CENTER FOR STRATEGIC & INT'L STUD. (Jun. 6, 2022), <https://www.csis.org/analysis/dod-updating-its-decade-old-autonomous-weapons-policy-confusion-remains-widespread> [<https://perma.cc/3F4A-CL3F>].

¹⁵ See generally ARMIN KRISHNAN, *KILLER ROBOTS: LEGALITY AND ETHICALITY OF AUTONOMOUS WEAPONS* 20 (2009).

¹⁶ AEGIS Weapon System or AEGIS ships refer to a system or combat ships equipped with systems that has an “integrated collection of sensors, computers, software, displays, and weapon launchers[.]” Besides the destroyers and cruisers of the United States Navy, countries like Japan, South Korea, Australia, Spain, and Norway operate AEGIS Weapon System or AEGIS ships within their armed forces. RONALD O'ROURKE, CONG. RSCH. SERV., RL33745, *NAVY AEGIS BALLISTIC MISSILE DEFENSE (BMD) PROGRAM: BACKGROUND AND ISSUES FOR CONGRESS 1-2* (2024).

¹⁷ *AEGIS Weapon System*, U.S. NAVY (Sep. 20, 2021), <https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2166739/aegis-weapon-system/> [<https://perma.cc/87PX-53TK>].

¹⁸ *Seek and Destroy: The Aegis Combat System*, NAVAL TECH. (Nov. 12, 2008), <https://www.naval-technology.com/features/feature45460/> [<https://perma.cc/7YRH-CSL7>].

¹⁹ Tyler Rogoway, *Everything You Ever Wanted to Know About the Navy's Ever-Evolving Aegis Combat System*, THE DRIVE: THE WARZONE (Mar. 4, 2021), <https://www.thedrive.com/the-war-zone/39508/how-the-aegis-combat-system-is-evolving-to-dominate-naval-warfare-of-the-future> [<https://perma.cc/3WD6-3BX5>].

computerized system could be categorized as an “autonomous weapon systems” or mere “automated” equipment is still unclear.²⁰

More recently, the U.S. Department of Defense directive DODD 3000.09 formally defined autonomous weapon systems from the perspective of U.S. policy²¹ as weapon systems that “can select and engage targets without further intervention by an operator.”²² The definition included systems that are “designed to allow operators to override operation of the weapon system, but can select and engage targets without further operator input after activation.”²³ This was differentiated from the definition of “semi-autonomous weapon system” in the same directive, which was designated as a system that can “only engage . . . targets . . . that have been selected by an operator.”²⁴ This was consistent with the definition produced in a November 2022 Congressional Research Service report, where the term “lethal autonomous weapon system” or LAWS was defined as a “class of weapon systems that use sensor suites and computer algorithms to independently identify a target and employ an onboard weapon system” to engage targets “without manual human control[.]”²⁵ Other scholarly articles have also defined the LAWS as systems capable of making engagement decisions.²⁶

²⁰ See KRISHNAN, *supra* note 15, at 33; *see also* Ajey Lele, *Debating Lethal Autonomous Weapon Systems*, 13 J. DEFENCE STUD. 51, 61 (2019) (pointing out that “no [] clarity exists” as to what degree of commander’s intervention would qualify or disqualify a system from being defined as autonomous.).

²¹ Allen, *supra* note 14; *see also* Department of Defense Directive 3000.09, *Autonomy in Weapon Systems* (2023).

²² Department of Defense Directive 3000.09, *Autonomy in Weapon Systems* (2023).

²³ *Id.*

²⁴ *Id.*

²⁵ SAYLER, *supra* note 2, at 1.

²⁶ See Heather M. Roff, *Lethal Autonomous Weapons and Jus Ad Bellum Proportionality*, 47 CASE W. RES. J. INT’L L. 37, 38 (2015) (defining that autonomous weapon systems “are armed weapon systems, capable of learning and adapting their ‘functioning in response to changing circumstances in the environment in which [they are] deployed,’ as well as capable of making firing decisions on their own[.]”); *see also* Davison, *supra* note 7, at 5 (describing that autonomous weapons are any “weapon system that can select (search for, detect, identify, track or select) and attack (use force against, neutralize, damage or destroy) targets without human intervention”); *see also* PAUL SCHARRE, *ARMY OF NONE: AUTONOMOUS WEAPONS AND THE FUTURE OF WAR* 46 (2018) (explaining that fully autonomous weapon systems keep humans out of the loop in the steps of searching for and detecting a target, deciding to engage the target, and engaging the target).

Some scholars have argued that this threshold of complete independence is too high and should be lowered,²⁷ arguing that certain weapon systems such as remote-piloted aircraft, fixed defensive systems, and other land, sea, and submarine systems have been “automated” with the potential to be turned into autonomous systems.²⁸ Under this school of thought, the AEGIS system described above would fall under the definition of an “autonomous” system as well as other fire-and-forget cruise missiles with pre-programmed autonomy because of their ability to collect battlefield data, calculate path or engagement priorities using their onboard computer systems, and suggest course of action to their respective human operators.²⁹ Some even argue that weapon systems such as land mines—which can be triggered mechanically without human intervention or computer software—can and should be considered “autonomous weapons.”³⁰

What is more troubling is that there is no internationally accepted definition of autonomous weapons or LAWS despite years of negotiations at the United Nations.³¹ But many scholars outside the U.S. have echoed the “humans out of the loop” element as the necessary aspect of the definition of “autonomous weapon systems.”³² Despite the depth and

²⁷ See Peter Asaro, *On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-making*, 94 INT’L REV. RED CROSS 687, 690-91 (2012).

²⁸ See *id.* at 690.

²⁹ *Id.*

³⁰ See *What You Need to Know About Autonomous Weapons*, INT’L COMM. OF THE RED CROSS (Jul. 26, 2022), <https://www.icrc.org/en/document/what-you-need-know-about-autonomous-weapons#:~:text=Mines%20can%20be%20considered%20rudimentary,anti%2D personnel%20mines%20in%201997> [<https://perma.cc/99MZ-QM99>] (stating that “[m]ines can be considered rudimentary autonomous weapons”).

³¹ See Allen, *supra* note 14.

³² VINCENT BOULANIN ET AL., *AUTONOMOUS WEAPON SYSTEMS AND INTERNATIONAL HUMANITARIAN LAW: IDENTIFYING LIMITS AND THE REQUIRED TYPE AND DEGREE OF HUMAN-MACHINE INTERACTION 2* (2021) (stating that “[t]here is no internationally agreed definition of ‘autonomous weapon systems’” and that it should be defined as a system that can identify, select, and engage targets “without human intervention”); see also Ted Piccone, *How Can International Law Regulate Autonomous Weapons?*, BROOKINGS INST. (Apr. 10, 2018), <https://www.brookings.edu/blog/order-from-chaos/2018/04/10/how-can-international-law-regulate-autonomous-weapons/> [<https://perma.cc/GN87-73NR>] (explaining that autonomous weapons have capabilities “to target and attack in a dynamic environment without human control”); GENEVA ACAD. OF INT’L HUMANITARIAN L. & HUM. RTS., ACADEMY BRIEFING NO. 8: AUTONOMOUS WEAPON SYSTEMS UNDER INTERNATIONAL LAW 13 (2014) (defining the term “autonomous weapon systems” as those “that can select and engage targets without a human override” based loosely on the United Nations Special Rapporteur on extrajudicial, summary or arbitrary executions and Human Rights Watch definitions).

extent of the debate over what the definition of an autonomous weapon should be, the accountability concerns relating to the conduct of these weapon systems have consistently been raised. The lack of a universal definition of the “autonomous” character of a weapon system is certainly a concern when it comes to legal analysis. Definitions are crucial in legal systems because “some definitions are akin to rules in that they actually the law.”³³ Without a definition, no further legal analysis can be conducted under any framework. As will be described further in the following sections, the lack of a definition for “autonomous” weapon systems will certainly prevent existing frameworks from addressing violations of international humanitarian law committed by LAWS.

II. LAWS AND WAR CRIMES

Although some governments have shown little interest in replacing humans with LAWS entirely in their respective armed forces, it has been recognized that LAWS could carry out a range of useful functions—such as gathering intelligence, providing protection, and carrying out rescue missions—alongside human elements or on their own.³⁴ Once these LAWS are deployed in armed conflicts of the future, they will be required to follow the rules of international humanitarian law, which requires combatants to make “context-dependent, evaluative legal judgments” under certain core principles.³⁵ Unfortunately, warzones are full of unpredictability and surprises involving mission climate, the presence of civilians, and the increasing necessity to conduct urban warfare.³⁶ Even in the age of smart bombs³⁷ and precision-guided missiles, human soldiers

³³ Otto Stockmeyer, *The Importance of Definitions*, COOLEY L. SCH., <https://info.cooley.edu/blog/the-importance-of-definitions> [<https://perma.cc/Z4YU-2NDF>] (last visited May 1, 2023).

³⁴ See *GENEVA ACAD. OF INT’L HUMANITARIAN L. & HUM. RTS.*, *supra* note 32, at 13.

³⁵ See INT’L COMM. OF THE RED CROSS, *supra* note 30.

³⁶ See Laurent Gisel et al., *Urban Warfare: An Age-Old Problem in Need of New Solutions*, HUMANITARIAN L. & POL’Y (Apr. 27, 2021), <https://blogs.icrc.org/law-and-policy/2021/04/27/urban-warfare/> [<https://perma.cc/87DY-XRQ2>] (stating that conflicts in recent years have increasingly taken place in towns and cities and such phenomenon will continue in future armed conflicts); *see also* Sam Plapinger, *Urban Combat Is Changing. The Ukraine War Shows How*, DEF. ONE (Feb. 3, 2023), <https://www.defenseone.com/ideas/2023/02/ukraine-war-shows-how-urban-combat-changing/382561/> [<https://perma.cc/JT8Y-F53G>]; Carlo J.V. Caro, *Unpacking the History of Urban Warfare and its Challenges in Gaza*, STIMSON (Oct. 17, 2023), <https://www.stimson.org/2023/unpacking-the-history-of-urban-warfare-and-its-challenges-in-gaza/> [<https://perma.cc/7RQW-83DF>].

³⁷ “Smart bomb” is a regular bomb that has been modified with navigational guidance systems that can control the bomb’s fins or wings. These smart bombs are able to make adjustments to the angle of attack or the direction of its fall, making them significantly more precise than conventional, free-falling “dumb bombs.” See Smart Bomb, BRITANNICA,

have struggled to comply with two core rules of international humanitarian law—the rules of distinction and proportionality—in various conflicts within the past decade.³⁸ Therefore, it is important to ask whether LAWS deployed in future armed conflicts will face the same risk and, in the worst case, violate rules of distinction and proportionality. The answer is, unfortunately, a clear yes.

1. The Rule of Distinction & the Crime of Attacking Civilians

The rule of “distinction” is one of the fundamental basic rules of international humanitarian law, which requires the parties of an armed conflict to “distinguish between civilians and combatants” and conduct operations directed only “against military objectives.”³⁹ The easiest example of failing this “distinction” duty is attacking civilians directly. Under international humanitarian law, the civilian population and individual civilians shall “enjoy general protection against dangers arising from military operations.”⁴⁰ Civilians are not to be subject to an attack unless they take “a direct part in hostilities.”⁴¹

The line between “combatant” and “civilians” becomes difficult, however, when civilians participate in hostilities in an indirect manner. For instance, “rioting civilians—even unarmed—can be “considered as directly participating in hostilities” if they are performing acts of violence in order to support the combatants on their side.⁴² Furthermore, many combatants in Iraq often wore civilian clothes and operated civilian cars, taxis, and

<https://www.britannica.com/technology/smart-bomb> [<https://perma.cc/7JUC-GLLK>] (last visited Dec. 30, 2023).

³⁸ See Evan J. Criddle, *Proportionality in Counterinsurgency: A Relational Theory*, 87 NOTRE DAME L. REV. 1073, 1074 (2013) (explaining that many counterinsurgency operations in Afghanistan, Chechnya, Iraq, Sri Lanka, Sudan, and other locations highlighted conflicting standards for determining proportionality when it came to counterinsurgency uses of force). See generally Michael N. Schmitt, *Targeting and International Humanitarian Law in Afghanistan*, 85 U.S. NAVAL WAR COLL. INT’L L. STUD. 307, 312-27 (explaining that counterinsurgency operation and targeting involved various proportionality and distinction challenges); Waseem Ahmad Qureshi, *Applying the Principle of Proportionality to the War on Terror*, 22 RICH. PUB. INT. L. REV. 379 (2019) (arguing that the harm and destruction caused by the War on Terror in Afghanistan, Iraq, and Syria far outweighs the military justifications).

³⁹ JEAN-MARIE HENCKAERTS & LOUISE DOSWALD-BECK, CUSTOMARY INTERNATIONAL HUMANITARIAN LAW: RULES 3, 25 (2005).

⁴⁰ Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts [hereinafter Protocol I] art. 51(1), Jun. 8, 1977, 1125 U.N.T.S. 3.

⁴¹ *Id.* art. 51(2) - (3).

⁴² Liron Libman, *The Blurred Distinction Between Armed Conflict and Civil Unrest: Recent Events in Gaza*, LAWFARE (Apr. 17, 2018, 7:00 AM), <https://www.lawfaremedia.org/article/blurred-distinction-between-armed-conflict-and-civil-unrest-recent-events-gaza> [<https://perma.cc/9XMA-BF4Y>].

buses,⁴³ making it difficult to visually distinguish between combatants and civilians. Undercover military operations involve combatants disguised in civilian clothes as well.⁴⁴

There have been attempts to define comprehensive rules that respond to such tragic ambiguities, although these generally have remained controversial and unapplied. For instance, the International Committee of the Red Cross published Interpretive Guidance in 2009, mandated that a civilian act on a “spontaneous, sporadic, or unorganized basis” that meets the following criteria can be classified as a combatant: (1) it has the likelihood of adversely affecting the military operation or capacity or “inflicting death, injury, or destruction on persons or objects protected”; (2) there exists a “direct causal link between the act and the harm likely to result”; and (3) the act of the civilian “must be specifically designed to directly cause the required threshold of harm.”⁴⁵ Article 41 of the 1977 Additional Protocol I also sets forth prohibitions of attacks on persons who “clearly express[] an intention to surrender,” are under the control of the attacking party, or are unconscious or incapacitated.⁴⁶

Whether LAWS will be able to comply with various guidelines and rules under international humanitarian law will certainly depend on the maturity of recognition technology and the complexity of onboard decision-making software. And, of course, highly sophisticated optical and electronic sensors are more likely to detect and identify various elements on the battlefield compared to bare human eyes. As technology became more developed, proponents of further LAWS development have argued that weapon systems with autonomous capabilities may have great humanitarian benefits on the battlefield, arguing that the use will likely reduce the need to use high explosives and ensure more accurate identification of civilians in a warzone.⁴⁷

However, even state-of-the-art weapon systems with the latest technologies can fail. One example is the case of Iran Air Flight 655, in

⁴³ See Robert J. Bunker & John P. Sullivan, *Suicide Bombings in Operation Iraqi Freedom*, 46W INST. LAND WARFARE 7 (2004).

⁴⁴ See Ido Rosenzweig, *Combatants Dressed as Civilians? The Case of the Israeli Mista'arvim Under International Law*, 2014 ISR. DEMOCRACY INST. 8 (discussing the history and prevalence of undercover military units using civilian clothing).

⁴⁵ Nils Melzer (Legal Adviser for Int'l Comm. of the Red Cross), *Interpretive Guidance on the Notion of Direct Participation in Hostilities Under International Humanitarian Law*, at 46 (May 2009), <https://www.icrc.org/en/doc/assets/files/other/icrc-002-0990.pdf> [https://perma.cc/364W-M2SV].

⁴⁶ See Protocol I, *supra* note 40, art. 41.

⁴⁷ See Hitoshi Nasu & Christopher Korpela, *Stop the “Stop the Killer Robot” Debate: Why We Need Artificial Intelligence in Future Battlefields*, COUNCIL ON FOREIGN RELS. (Jun. 21, 2022, 11:57 AM), <https://www.cfr.org/blog/stop-stop-killer-robot-debate-why-we-need-artificial-intelligence-future-battlefields> [https://perma.cc/9UQ8-7C6X].

which an Iranian airliner was shot down by *USS Vincennes*⁴⁸ in 1988.⁴⁹ Following valid rules of engagement and assessment of threats based on radar contact, the crewmen aboard *Vincennes* took action to shoot down what seemed to be an Iranian F-14 fighter jet.⁵⁰ It was later found out that the destroyed aircraft was an Iranian passenger flight carrying 290 people on board.⁵¹ Although the facts of the incident are still being disputed by families and commentators, two concerns can be drawn from this incident. First, assuming the crews of *Vincennes* correctly followed the rules of engagement and standard operating procedures, the miscalculation and distortion of data on the AEGIS radar system contributed to the apparent failure of “distinction.” Furthermore, more importantly, “failure” in weapon systems costs lives and reliance on LAWS—and its independent decision-making abilities—may also result in another Iran Air Flight 655 in future conflict zones if the data collected from the field using sophisticated sensors are simply “wrong”.

Mistaken assessment of collateral damage or threats can also happen. For instance, remote-controlled drones have often come under criticism for causing civilian casualties in the military’s attempt to engage legitimate military targets. In Afghanistan alone, for instance, the U.S. conducted over 13,000 drone strikes since 2015, killing over 10,000 people including at least 66 children.⁵² The United States has justified its drone operations by stating that drone strikes are often the result of whether the intended target presents an “imminent threat,” a factor determined by weighing multiple considerations including the potential harm of missing the window of opportunity.⁵³ If such an evaluation process is infused into

⁴⁸ USS *Vincennes* was the third Ticonderoga class AEGIS guided missile cruiser of the United States Navy. The ship was launched in 1984 and commissioned in 1985. At the time, AEGIS-equipped cruisers were one of the most significant achievements of the United States Navy after 20 years of development. See Joseph L. McClane, Jr. & James L. McClane, *The Ticonderoga Story: Aegis Works*, U.S. NAVAL INST. (May 1985), <https://www.usni.org/magazines/proceedings/1985/may/ticonderoga-story-aegis-works> [<https://perma.cc/JRA4-6GYU>].

⁴⁹ See Iran Air Flight 655, BRITANNICA, <https://www.britannica.com/event/Iran-Air-flight-655> [<https://perma.cc/JQH8-VLKF>].

⁵⁰ See *id.*

⁵¹ See *id.*

⁵² *Strikes in Afghanistan*, THE BUREAU OF INVESTIGATIVE JOURNALISM, https://www.thebureauinvestigates.com/projects/drone-war/charts?show_casualties=1&show_injuries=1&show_strikes=1&location=afghanistan&from=2015-1-1&to=now (last visited Sept. 17, 2022) [<https://perma.cc/UA5F-CSAG>].

⁵³ See Eric Holder, Attorney General of the U.S., Speech at Northwestern University School of Law (Mar. 5, 2012), (transcript available at <https://www.justice.gov/opa/speech/attorney-general-eric-holder-speaks-northwestern-university-school-law> [<https://perma.cc/9H62-QFAZ>]) (“The evaluation of whether an individual presents an “imminent threat” incorporates

LAWS, advancement in either the hardware or software technology implemented in LAWS is likely to produce similar outcomes—failure of distinction and harm to civilians.

On the other hand, certain seemingly civilian-looking elements can pose legitimate threats. In extreme cases, egregious violations such as purposeful disguise as civilians or “perfidy”—the act of inviting the confidence of an adversary to lead him to believe that he is entitled to, or is obliged to, accord—are likely to complicate the on-board machine-learning software of LAWS especially when their missions are to both protect the friendly elements within its area of operations as well as comply with the international humanitarian law. Suicide bombings using civilian vehicles such as buses, trucks, and fishing boats are likely to exacerbate this issue as the intent to attack is revealed seconds before the bomb explodes. Furthermore, even the most sophisticated sensors and radars have often failed to detect and identify small civilian vehicles in certain conditions such as waterborne environments.⁵⁴

More significantly, technological limitations do not serve as an “excuse for failing to comply with [international humanitarian law].”⁵⁵ Just like their human counterparts, the capabilities of weapon systems are to be embedded into the “distinction” assessment.⁵⁶ For instance, a commander who chooses to conduct a precision-bombing campaign in the middle of a highly populated city while knowing that his equipment is not even capable of being precisely guided would not escape blame under the rule of distinction. Should militaries use LAWS knowing that they can fail in distinguishing civilians from armed personnel within their “autonomous” capacities? To what extent should such technical glitches be tolerated? Furthermore, should accountability be imposed on the operator of LAWS when the entire decision-making process was conducted by the onboard artificial intelligence systems? Fundamental questions like these are at the forefront as more LAWS are being developed with the intent to be deployed in active armed conflicts. Unfortunately, as explained further below, there are no contemporary guidelines or frameworks that can address the battlefield decisions of LAWS which may have unlawful consequences. Particularly, when it comes to the rule of distinction, it will

considerations of the relevant window of opportunity to act, the possible harm that missing the window would cause to civilians, and the likelihood of heading off future disastrous attacks against the United States.”).

⁵⁴ See HOUSE ARMED SERVS. COMM. STAFF, THE INVESTIGATION INTO THE ATTACK ON THE U.S.S. COLE 11-13 (2001), https://www.bits.de/public/documents/US_Terrorist_Attacks/HASC-colereport0501.pdf [<https://perma.cc/VY55-XF33>].

⁵⁵ See GENEVA ACAD. OF INT’L HUMANITARIAN L. & HUM. RTS., *supra* note 32, at 14.

⁵⁶ See Alexander Blanchard & Mariarosaria Taddeo, *Predictability, Distinction & Due Care in the Use of Lethal Autonomous Weapon Systems*, SSRN ELEC. J. 3-4 (May 6, 2022), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4099394 [<https://perma.cc/N68S-9PT6>].

become extremely difficult to hold any of the machine, the military, or the manufacturer liable for the damages.

2. The Rule of Proportionality & the Crime of Attack or Retaliation in a Disproportionate Manner

If it is considered difficult in any environment to respect the rules of distinction, “it is all the more difficult to make [a] judgment of proportionality” prior to the engagement.⁵⁷ The rule of “proportionality” is another important rule of international humanitarian law. Under international humanitarian law, excessive harm on civilian must be avoided at all costs.⁵⁸ However, Additional Protocol I to the 1979 Geneva Conventions lays out that military forces are prohibited from launching “an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilians’ objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.”⁵⁹ In a judgment of the International Criminal Tribunal for the Former Yugoslavia (“ICTY”), the standard of determining the “excessive” nature was by evaluating whether a “reasonably well-informed person in the circumstances of the actual perpetrator, making reasonable use of the information available to him or her, could have expected excessive civilian casualties to result from the attack.”⁶⁰ The issue with this standard is that it is *extremely subjective*.⁶¹

For instance, in a well-known ICTY case of *Prosecutor v. Prlić et al.*, the tribunal determined that the destruction of an old bridge harmed the Muslim civilians of Mostar by preventing access to food and medical supplies.⁶² In this case, Jadranko Prlić and other members of the Croatian Defence Council (HVO) destroyed the Old Bridge of Mostar, a structure that had persisted since the 15th century.⁶³ The defendants here contended that they targeted the bridge in order to prevent their enemies—the members of the Army of the Republic of Bosnia and Herzegovina—from

⁵⁷ Stuart Casey-Maslen, *Autonomous Weapons Systems and International Criminal Law*, in *DRONES & OTHER UNMANNED WEAPONS SYS. UNDER INT’L L.* 217, 236 (2018).

⁵⁸ *See id.* at 233.

⁵⁹ Protocol I, *supra* note 40, art. 51(5)(b).

⁶⁰ *Prosecutor v. Galić*, Case No. IT-98-29-T, Judgment, ¶ 58 (Int’l Crim. Trib. for the Former Yugoslavia Dec. 5, 2003).

⁶¹ *See* THE JUDGE ADVOC. GEN.’S SCH., *AIR FORCE OPERATIONS AND THE LAW* 19 (3rd ed. 2014) (explaining that “[p]roportionality in attack is an inherently subjective determination that will be resolved on a case-by-case basis.”).

⁶² *See* *Prosecutor v. Prlić et al.*, Case No. IT-04-74-T, Judgment (Vol. 3), ¶ 1582 (Int’l Crim. Trib. for the Former Yugoslavia May 29, 2013).

⁶³ *See id.* ¶ 1581; *see also* *Old Bridge Area of the Old City of Mostar*, UNESCO WORLD HERITAGE CONVENTION, <https://whc.unesco.org/en/list/946/> (last visited Apr. 5, 2023) [<https://perma.cc/4HHG-RWU3>].

sending food and supplies to their troops.⁶⁴ ICTY held that the destruction of historic property for military advantage violates international law if the expected incidental loss to civilians is disproportionate to the military advantage obtained.⁶⁵ The Trial Chamber further concluded that the attack's impact on the Muslim population of Mostar was disproportionate to the concrete and direct military advantage expected, after finding that the destruction was also partially motivated by the goal to impact the morale of the Muslim population.⁶⁶

Applying the same line of logic under the rule of proportionality, an ICTY report addressing the NATO bombing campaign against Yugoslavia concluded otherwise.⁶⁷ In this case, the case involved NATO's bombing campaign that involved thousands of air strikes that targeted industrial structures, government ministries, media centers, and oil refineries.⁶⁸ Various groups raised allegations that NATO's method of bombing casts doubt about the ability of NATO pilots in terms of distinction and proportionality.⁶⁹ In fact, many civilian workers lost their lives as a result of this campaign and some even stipulated that the bombings exceeded the extent of force necessary to neutralize these facilities. Applying the "reasonable military commander" standard as before, the Report concluded that the obligation to abide by rules of distinction and proportionality has been met by the implementation of precision munitions and modern aircraft technologies.⁷⁰ As shown by these two cases arising out of the same conflict, the applicability of the rule of distinction is highly subjective – often depending on variables that cannot be assessed or predicted on the ground during the armed conflict.

It is questionable whether LAWS will fully accommodate and execute their missions, ones which encompass the various considerations human elements have traditionally taken. As international humanitarian law depends on human judgment, based on "common sense and good faith for military commanders[,]” it is certainly questionable whether LAWS will be able to make prudent proportionality analyses depending on a multitude

⁶⁴ See Prosecutor v. Prlić et al., Case No. IT-04-74-T, ¶ 1582.

⁶⁵ See *id.* ¶¶ 1584-85.

⁶⁶ Press Release, Int'l Crim. Trib. for the former Yugoslavia, Six Senior Herceg-Bosna Officials Convicted (May 29, 2013), <https://www.icty.org/en/sid/11324> [<https://perma.cc/BLD2-3VQW>].

⁶⁷ See Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia, Int'l Crim. Trib. for the Former Yugoslavia, 39 I.L.M. 1257 (2000) [hereinafter ICTY NATO Bombing Report].

⁶⁸ See *id.*

⁶⁹ See *id.*

⁷⁰ See *id.*

of contextual factors on the battlefield.⁷¹ Even if LAWS can be programmed to anticipate and balance the potential benefits and harms of causing damage to civilians, the issue still lies in the inconsistent application of the “reasonable military commander” standard in proportionality cases.⁷² Without any uniform guideline among States on how proportionality must be calculated, the engagement of LAWS may at times fall under the violation of international humanitarian laws under the principle of proportionality.

III. THE SHORTCOMINGS OF CURRENT FRAMEWORKS

Compared to the speed of technological advancements and the implementation of artificial intelligence in LAWS, the existing frameworks for legal accountability are “ill suited” and inadequate for addressing potential crimes that LAWS may cause in armed conflicts.⁷³ Accountability is crucial in international humanitarian law because it is both “forward-looking” and “backward-looking,”⁷⁴ Specifically, it not only provides scrutiny and oversight after a certain crime has occurred, but also preventive and anticipatory measures against reproduction and reoccurrence of such crime.⁷⁵ This section explores how the two available ways of legal remedies—international criminal law accountability and civil suit against the military—are ill-equipped to hold anyone accountable for the potential crimes committed by LAWS.

1. International Criminal Law

Similar to domestic criminal jurisdictions, International Criminal Law (“ICL”) imposes individual criminal responsibility when a person directly commits a crime or engages in other forms or modalities of criminal conduct.⁷⁶ Both direct and indirect modalities of liability for war crimes are relevant in the context of LAWS as these systems make decisions to engage seemingly hostile elements of conflict independently without human intervention. Under the current jurisprudence, however, both legal elements and punishments involving criminal accountability under the ICL seem to be inadequate and inapplicable to LAWS.

A. Direct Responsibility

The doctrine of direct responsibility holds a perpetrator liable for the crime they have committed. According to Article 7(1) of the Statute of the International Tribunal, “[a] person who planned, instigated, ordered,

⁷¹ *Mind the Gap: The Lack of Accountability for Killer Robots*, HUMAN RIGHTS WATCH, (Apr. 9, 2015), https://www.hrw.org/report/2015/04/09/mind-gap/lack-accountability-killer-robots#_ftnref81 [<https://perma.cc/3W4P-CUVX>].

⁷² See Prlić, *supra* note 62; see also ICTY NATO Bombing Report, *supra* note 66.

⁷³ HUMAN RIGHTS WATCH, *supra* note 71.

⁷⁴ Ilse Verdiesen et al., *supra* note 7, at 141.

⁷⁵ See *id.* at 143.

⁷⁶ Casey-Maslen, *supra* note 57, at 237.

committed or otherwise aided or abetted in the planning, preparation or execution of a crime referred to in Articles 2 to 5 . . . shall be individually responsible for the crime.”⁷⁷ Furthermore, as the 1977 Additional Protocol I stated, an attack that may be “expected to cause incidental loss of civilian life” is a form of indiscriminate attack, punishable under international humanitarian law.⁷⁸ Going back to the rules of distinction and proportionality, one may be found directly responsible for conducting an attack if the attacker was “in the knowledge” that it would cause “incidental loss of life or injury to civilians or damage to civilian objects[.]”⁷⁹

Under the current Rome Statute, however, AI onboard LAWS cannot be held accountable for their actions simply because the statute does *not* apply. International criminal tribunals, such as the International Criminal Court, are generally limited to exercise jurisdiction over “natural persons” pursuant to the governing statute.⁸⁰ This offers insufficient grounds for holding any LAWS accountable for the crimes that occurred even though the attack was based on an independently decided course of engagement.

Even if the jurisdiction over LAWS and its AI system were granted under a broader interpretation of the international tribunal’s jurisdiction, the *mens rea* requirement would provide another difficult challenge. Two requirements must be met for there to be a criminal act: (1) *actus reus*, or the act itself, and (2) *mens rea*, or the mental state.⁸¹ AIs, of course, can engage in certain antisocial or criminal conduct.⁸² However, it is still unclear whether an AI could be culpable because “it merely executes

⁷⁷ S.C. Res. 827, *Statute of the 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*, art. 7, ¶ 1 (May 25, 1993).

⁷⁸ Protocol I, *supra* note 40, art. 51, ¶¶ 4-5.

⁷⁹ Rome Statute of the International Criminal Court, art. 8(2)(b)(iv) (July 1, 2002) [hereinafter Rome Statute].

⁸⁰ *Id.* art. 25(1).

⁸¹ See HUMAN RIGHTS WATCH, *supra* note 71.

⁸² See Giannis Tziakouris, *The Rise of AI-powered Criminals: Identifying Threats and Opportunities*, CISCO TALOS (Aug. 14, 2023), <https://blog.talosintelligence.com/the-rise-of-ai-powered-criminals/#:~:text=Another%20area%20of%20criminal%20activity,and%20AI%2Dpowered%20scam%20bots> [https://perma.cc/BK7R-CDEP]; see also Alex Mitchell, *Criminals Are Using AI in Terrifying Ways – and It’s Only Going to Get Worse*, NEW YORK POST (May 10, 2023, 11:25 AM), <https://nypost.com/2023/05/10/criminals-are-using-ai-in-terrifying-ways/> [https://perma.cc/7VHF-ZUDR] (providing an example of when the artificial intelligence is designed to conduct phishing and social engineering attacks, it is still engaging in criminal conducts).

programming.”⁸³ Unless AIs onboard LAWS are treated as sentient beings—a question which this paper will not address—the traditional *mens rea* requirements of criminal law seem fundamentally misplaced and inapplicable, further showing the existence of the accountability gap.

More importantly, punishing LAWS for direct responsibility for war crimes is seemingly inappropriate and involves various philosophical challenges. According to H.L.A. Hart, punishment has five elements, one of which is that it “must involve pain or other consequences normally considered unpleasant.”⁸⁴ Furthermore, punishment would be justified only if its positive justifications outweigh negative limitations.⁸⁵ However, as some argue, it is fundamentally impossible to punish an artificial intelligence or algorithm as they do not experience pain or other consequences normally considered unpleasant.⁸⁶ In other words, even if the AI is reprogrammed or terminated, there would be no “positive justifications” of punishment as the AI cannot “experience things as painful[.]”⁸⁷ With no practical way to impose direct responsibility to LAWS and punish them accordingly, there would be no way to hold “direct” perpetrators of crimes under the international humanitarian law.

B. “Command” Responsibility

Rome Statute Article 28 provides that a military commander, or person who is working as the effective command and control or effective authority, can be criminally liable for the crimes committed by his subordinates if he did not take any active measures to stop the crime or stayed criminally negligent to the crime.⁸⁸ Article 25(3)(a) of the statute also adopts a concept of co-perpetration based on the notion of control of the crime in the sense that a person can become a co-perpetrator of a crime “only if he or she has ‘joint control’ over the crime as a result of the essential contribution ascribed to him or her.” In the absence of practical ways to hold LAWS directly responsible for crimes committed, it may seem that the human commanders in charge of the LAWS at issue should be held responsible for said crimes. Unfortunately, holding the military commanders liable for the actions of its LAWS “subordinates” is even harder than holding them responsible for their human subordinates.

Three main elements of command responsibility in Article 28 of the Rome Statute are:

⁸³ RYAN ABBOT, *THE REASONABLE ROBOT: ARTIFICIAL INTELLIGENCE AND THE LAW* CAMBRIDGE UNIV. PRESS 14 (Jun. 29, 2020).

⁸⁴ H.L.A. HART, *PUNISHMENT AND RESPONSIBILITY*, OXFORD UNIV. PRESS 4 (2d ed. 2008), (Mar. 6, 2008).

⁸⁵ See Abbot, *supra* note 83, at 115.

⁸⁶ See Hart, *supra* note 84, at 4.

⁸⁷ See Abbot, *supra* note 83, at 123.

⁸⁸ Rome Statute, *supra* note 79, art. 28.

- (i) The existence of a superior-subordinate relationship;
- (ii) The superior knew or should have known that international crimes were about to be committed or had been committed by subordinates; and
- (iii) The commander fails to take the necessary and reasonable measures to prevent or repress the commission of the crimes or to submit the matter to the competent authorities for investigation and prosecution.⁸⁹

In addition to these elements, there also needs to be “a causal nexus between the crimes and the commander’s failure to exercise” his or her power to prevent the action.⁹⁰ There are many possible ways that can arguably hold commanders liable if the LAWS engage in an unlawful attack in conflict when its superior is directly involved in the deployment of the LAWS. For instance, some argue that accountability for a remote commander who is “actively monitoring the [LAWS]” through a livestream video would not be so different from “the tactical commander who orders and specifies a mission for the [LAWS].”⁹¹

Unfortunately, the required elements we have in the existing framework are not suited to accommodate the actions and decision-making processes of LAWS. “Intent” is an important aspect of proving criminal liability under command responsibility.⁹² A commander cannot be held criminally responsible without a proof showing that the intent to commit a crime was “shared” between the commander and the subordinate. As explained in the previous section, LAWS cannot have the mental state required to make its actions into a “crime.”⁹³

Furthermore, the third element also serves as an obstacle in holding commanders responsible for the crimes of the LAWS. Robots cannot be punished, in theory, as they are incapable of experiencing pain and suffering.⁹⁴ Additionally, if we are looking at situations where machine-learning AI systems onboard LAWS simply “react” based on a battlefield situation with no prior record of such actions, there would be no way for the commander to reasonably prevent or repress the commission of a crime

⁸⁹ Rome Statute, *supra* note 79, art. 28.

⁹⁰ *See id.*; *see also* Russell Buchan & Nicholas Tsagourias, *Autonomous Cyber Weapons and Command Responsibility*, 96 INT’L L. STUD. 645, 652 (2020).

⁹¹ Michael Press, *Of Robots and Rules: Autonomous Weapon Systems in the Law of Armed Conflict*, 48 GEO. J. INT’L L. 1337, 1363 (2018).

⁹² *See* Vivek Sehrawat, *Autonomous Weapons System and Command Responsibility*, 31 FLA. J. INT’L L. 315, 329 (2021).

⁹³ *See id.*

⁹⁴ *See* Hart, *supra* note 84, at 4.

as they are unlikely to be well-equipped or have the knowledge to diagnose the AI systems deployed in the battlefield.⁹⁵

2. Civil Suit Against the Military

Another reasonable way that victims could hold someone accountable for the violation of international humanitarian law would be a civil suit against the military. Historically, both U.S. and non-U.S. courts have heard cases against one's own or foreign military leaders for war crimes and crimes against humanity.⁹⁶ However, most civil suits have traditionally been against specific individuals or private organizations that voluntarily represent those involved in the conflict – for instance, veterans' associations.

When it comes to LAWS and their potential criminal act under international humanitarian law, the traditional method of suing an individual or an entity would not be adequate because, as explained above, LAWS are capable of conducting the entire cycle of engagement decisions on their own. Naturally, therefore, a civilian victim of unlawful acts committed by a fully autonomous weapon (or his or her family) could potentially sue the military force that used the weapon.

Unfortunately, a suit against the military would probably not result in a favorable result for the plaintiffs. The U.S. military is likely to enjoy immunity from civil suits relating to its decisions to deploy LAWS based on the doctrine of sovereign immunity. Sovereign immunity keeps states “from being sued in foreign courts, but also eliminates state-to-state tort actions.”⁹⁷ This exemption is notably embedded in the Federal Tort Claims Act (“FTCA”). In theory, the FTCA allows civilians and victims of wrongful acts to bring suit against a government employee “if they were

⁹⁵ See John Dumond, et al., *Weapon System Sustainment Management: Concept for Revolutionizing the Army Logistics System*, DOCUMENTED BRIEFING, RAND (Apr. 8, 1994); see also Robert J. Bowman, *DOD Wants Hypersonic Weapons. But the Supply Chain to Support Production Isn't There*, SUPPLYCHAINBRAIN (Jul. 24, 2023), <https://www.supplychainbrain.com/articles/37739-dod-wants-hypersonic-weapons-but-the-supply-chain-to-support-production-isnt-there> [<https://perma.cc/KQ5M-897B>] (explaining that weapon systems, especially complex, high-tech (largely digital) components create a burden on military logistics system resulting in reduced availability and increased costs).

⁹⁶ See Lisa Cogen, *U.S. Court Finds Former Liberian Military Commander Liable for War Crimes and Crimes Against Humanity*, CJA (Sept. 16, 2021), <https://cja.org/u-s-court-finds-former-liberian-military-commander-liable-for-war-crimes-and-crimes-against-humanity/> [<https://perma.cc/R8E8-MRMD>]; see also Phan Xuan Dung, *Vietnamese War Victims' Struggle for Justice*, THE DIPLOMAT (Oct. 17, 2022), <https://thediplomat.com/2022/10/vietnamese-war-victims-struggle-for-justice-a-tale-of-two-lawsuits/> [<https://perma.cc/R7G8-MGYF>].

⁹⁷ Elizabeth Fuzaylova, *War Torts, Autonomous Weapon Systems, and Liability: Why a Limited Strict Liability Tort Regime Should Be Implemented*, 40 CARDOZO L. REV. 1327, 1363 (2019).

wronged while the employee was acting within the scope of his duties.”⁹⁸ However, FTCA also reserves some exceptions for the United States government, notably the exception for any intentional torts claims that can be brought against a United States court. Furthermore, FTCA also designates an exception for any “combatant activities” that would most likely immunize the U.S. military from civil suits for the conduct of LAWS as part of legitimate foreign military campaign.⁹⁹

It is also highly unlikely that plaintiffs would prevail in foreign jurisdictions. For instance, “even jurisdictions with highly restrictive immunity doctrines, such as the United Kingdom, might well preclude these types of suits.”¹⁰⁰ Recently, the British Supreme Court controversially permitted the families of deceased British soldiers in Iraq to sue the British government for negligence and human rights violations.¹⁰¹ However, the court held for the government, stating that the United Kingdom Ministry of Defense would still be immune for “high-level policy decisions . . . or decisions made in the heat of battle.”¹⁰²

* * *

Internationally and domestically, victims of international humanitarian law are highly unlikely to prevail when it comes to war crimes committed by LAWS. While LAWS are evolving quickly, legal systems around the globe are playing catch-up. Because the inherent nature of international humanitarian law requires some international nexus, a solution with international – rather than domestic – implication is necessary to effectively address this accountability gap. The Outer Space Treaty serves as an excellent starting point.

IV. POTENTIAL SOLUTIONS

A solution to the accountability gap in the case of war crimes committed by LAWS can come from an unusual place: the Outer Space Treaty. “The Treaty on Principles of Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies” (or colloquially called “the Outer Space Treaty”) is an international agreement entered into force on October 10, 1967 and

⁹⁸ *Federal Tort Claims Act*, UNITED STATES HOUSE OF REPRESENTATIVES, <https://www.house.gov/doing-business-with-the-house/leases/federal-tort-claims-act> (last visited Apr. 9, 2024) [https://perma.cc/7TTC5-YE5A]; see 28 U.S.C. § 2674.

⁹⁹ See Andrew Finkelman, *Suing the Hired Guns: An Analysis of Two federal Defenses to Tort Lawsuits Against Military Contractors*, 34 BROOKLYN J. OF INT’L L. 395, 405 (2014).

¹⁰⁰ See HUMAN RIGHTS WATCH, *supra* note 71.

¹⁰¹ See Richard Norton-Taylor, *British Soldier Protected Under Human Rights Law*, THE GUARDIAN (Feb. 18, 2013, 13:49 EST), <https://www.theguardian.com/law/2013/feb/18/british-soldiers-human-rights-court> [https://perma.cc/2WYN-EG5K].

¹⁰² HUMAN RIGHTS WATCH, *supra* note 71.

adopted by the United Nations General Assembly in 1966.¹⁰³ Its primary objective is to promote the peaceful exploration, development, and use of outer space, while also establishing a framework for the regulation of activities in outer space.¹⁰⁴

The treaty was created in the “emergence of intercontinental ballistic missiles” and other initiatives by global superpowers—mainly the United States and the Soviet Union—to aggressively weaponize outer space.¹⁰⁵ The nations agreed that space should be “neutral territory” and off-limits for weapons and weapons testing.¹⁰⁶ Just like artificial intelligence, “[t]he vast majority of space technology is dual use” – meaning “it is of value to both the civil and military communities” – and “it is often impossible to tell whether any given technology is for offensive or defensive use.”¹⁰⁷ The Outer Space Treaty was later reaffirmed by the Prevention of an Arms Race in Outer Space resolution in 1981, which allowed United Nations member states to agree on a ban on the weaponization of space.¹⁰⁸

Of course, it is still highly debated whether the Outer Space Treaty was as successful as many had hoped it would be.¹⁰⁹ However, it is clear that general political and social oversight in the weapons-centric development of outer space has generally discouraged aggressive space development, although such development was once openly pursued by many nations.¹¹⁰ In the context of LAWS, many aspects of the Outer Space Treaty can provide helpful guidance in regulating and controlling LAWS in general,

¹⁰³ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Oct. 10, 1967, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

¹⁰⁴ *See id.*

¹⁰⁵ *See Outer Space Treaty*, CTR. FOR ARMS CONTROL AND NON-PROLIFERATION (Nov. 16, 2022), <https://armscontrolcenter.org/outer-space-treaty/> [https://perma.cc/37UC-JNHJ].

¹⁰⁶ *See id.*

¹⁰⁷ Joan Johnson-Freese & David Burbach, *The Outer Space Treaty and the Weaponization of Space*, BULL. OF THE ATOMIC SCI., (Jun. 27, 2019), <https://thebulletin.org/2019/06/the-outer-space-treaty-and-the-weaponization-of-space/> [https://perma.cc/2X58-BSXW].

¹⁰⁸ *Id.*

¹⁰⁹ *See The Outer Space Treaty Has Been Successful – But is It Fit for the Modern Age?*, SPACE.COM, <https://www.space.com/35758-outer-space-treaty-success-modern-assessment.html> (last visited Dec. 31, 2023) [https://perma.cc/VH7C-HN8B]; *see also* Rajeswari Pillai Rajagopalan, *the Outer Space Treaty: Overcoming Space Security Governance Challenges*, COUNCIL ON FOREIGN RELATIONS (Feb. 23, 2021), <https://www.cfr.org/report/outer-space-treaty> [https://perma.cc/8QAX-FQDU]; *but see* E. H. J. Roberds, *Failure of the Outer Space Treaty*, CANADIAN FORCES COLLEGE (2016).

¹¹⁰ *See* Hatem Elatawy, *Can We Defuse the Outer Space Arms Race?*, NAT’L INTEREST (Oct. 31, 2022), <https://nationalinterest.org/feature/can-we-defuse-outer-space-arms-race-205556/> [https://perma.cc/66LK-B5Z5].

as well as for filling in the accountability gaps in cases of war crimes committed by LAWS. An international treaty governing the weaponization of AI is crucial in preventing potential harm that could result from further development and deployment of LAWS in the battlefield.

1. Articles I & II: The Definition of “New Area” and “Conducts to be Controlled”

Definitions, as mentioned above, are a crucial part of a legal framework. They often govern—or prevent—further legal analysis within a framework and often result in frustrating conclusions before there is a chance to review a case’s substance. Accordingly, the establishment of a robust definition governing “autonomous” or “artificial intelligence” in an international treaty will provide a significant groundwork for further legal establishments in the regulation of artificial intelligence development and LAWS.

Article I of the Outer Space Treaty lays a robust groundwork for defining the nature of space and its meaning to mankind:

The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out *for the benefit and in the interests of all countries*, irrespective of their degree of economic or scientific development, and shall be *the province of all mankind*.

Outer space, including the moon and other celestial bodies, shall be *free for exploration and use by all States* without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies.

There shall be freedom of scientific investigation in outer space, including the moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation.¹¹¹

Article I is the cornerstone of modern understanding of space as a new frontier—one reserved for all mankind. Article I establishes the core purpose of space development and what principles each nation should bear. Because of Article I, all other Articles of the Outer Space Treaty are able to take effect by mandating member states to bear responsibility in safety and humanitarian assistance, to carry the responsibility of being liable for potential damages, and to share data should dangers arise from activities in space.¹¹² This principle is significant in the context of LAWS, as it imposes a duty on states to avoid activities that could cause harm to other states or their citizens. For example, if a state were to deploy LAWS that

¹¹¹ Outer Space Treaty, *supra* note 103, art. I (emphasis added).

¹¹² *See id.* art. III, V, VII.

targeted civilians or civilian objects, it would be in violation of this principle and could be held accountable for any resulting war crimes.

Article II of the Outer Space Treaty further declares that outer space is “not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.”¹¹³ This, in practice, prevents any nation from monopolizing on the development of space and allows member states to share scientific development, to a certain extent. This principle is of particular relevance in the context of LAWS, as weaponizing AI leads to further security barriers between nations in their respective developments. By defining a “common area” for all mankind like that defined within the Outer Space Treaty, it can provide a solid basis of defining a new “framework” that the international treaty can regulate and control.

One byproduct of this concept of “common area” would be Article VIII, which mandates that nations share data with member states when launching and retrieving spacecrafts.¹¹⁴ As Article VIII states:

Each State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth. Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return.¹¹⁵

This kind of mandate would not be possible without mutually agreed-upon definitions and principles of space and space exploration. Because the underlying framework defining “space” is not an appropriable territory, and also as an area that is for the interest of all mankind, the international cooperation clause in Article VIII was able to make its way into the Outer Space Treaty.

Establishing a robust legal principle for artificial intelligence that could expand into the development of LAWS will most certainly allow international tribunals and domestic courts to address the issue

¹¹³ Outer Space Treaty, *supra* note 103, art. II.

¹¹⁴ *Registration of Space Objects: Requirements and Procedures*, UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS (Sept. 11, 2023), https://www.unoosa.org/documents/pdf/Access2Space4All/KiboCUBE/RegulatoryWebinar/KiboCUBE_Regulatory_Webinar_Registration_of_Space_Objects_Rodrigues.pdf [<https://perma.cc/U9WU-JM69>].

¹¹⁵ Outer Space Treaty, *supra* note 103, art. VIII.

accountability gap more effectively. Of course, this definition would have to be followed by specific arms control and liability provisions in the hypothetical treaty governing LAWS.

2. Articles IV & VI: Specific “Arms Control” Provisions

Article IV of the Outer Space Treaty prohibits the placement of nuclear weapons or other weapons of mass destruction in orbit or on celestial bodies:

States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.

The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited.¹¹⁶

While this provision is not specifically directed at LAWS, it could be interpreted as a prohibition on the deployment of LAWS capable of causing indiscriminate or widespread harm. By prohibiting weapons of mass destruction in outer space, the Treaty establishes a normative framework for the regulation of all weapons that could be used to cause harm in outer space.

In practice, Article IV laid the foundation for international cooperation and the de-weaponization of space. Although “the ban on weapons in space was limited to nuclear and other weapons of mass destruction,” these weapons were the most concerning weapons during the Cold War when both superpowers were contemplating putting nuclear weapons “in orbit” or on the moon.¹¹⁷ As mentioned earlier in this paper, nonproliferation of LAWS should be sincerely considered by any new treaty governing the development of artificial intelligence and its employment in weapon systems. Certainly, the Outer Space Treaty did not accomplish complete nonproliferation across the entire planet. However, it is worth noting that the treaty was effective in convincing member states to not deploy weapons of mass destruction in space. Such nonproliferation efforts would

¹¹⁶ Outer Space Treaty, *supra* note 103, art. IV (emphasis added).

¹¹⁷ David C. DeFrieze, *Defining and Regulating the Weaponization of Space*, JFQ 74, (2014), https://ndupress.ndu.edu/Portals/68/Documents/jfq/jfq-74/jfq-74_110-115_DeFrieze.pdf [<https://perma.cc/4ZSA-QSPU>].

not be aimed at thwarting technological development, but rather at preventing any further development of artificial intelligence into a *lethal* weapon system.

Furthermore, Article VI also requires states to bear international responsibility for national activities in outer space, whether carried out by governmental or non-governmental entities:

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space, including the moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.¹¹⁸

This provision is significant in the context of LAWS, as it imposes a duty on states to ensure that any private actors involved in the development or deployment of LAWS are held accountable for their actions under the norms of customary international law. By requiring states to bear international responsibility for the activities of non-governmental entities, the Treaty helps to fill in the accountability gaps that might otherwise exist in cases where LAWS are developed or deployed by private actors.

3. Articles VII: Liability Clause

The last piece that could be replicated in the hypothetical LAWS Treaty would be the imposition of liabilities and responsibilities as operators of AI in national militaries. Outside of lethal weapons, AI can still be used in various other functions of military equipment. Article VII of the Outer Space Treaty states:

Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air or in

¹¹⁸ Outer Space Treaty, *supra* note 103, art. VI.

outer space, including the moon and other celestial bodies.¹¹⁹

The practical impact of Article VII is evident in various international treaties and conventions that followed it. One was the Convention on International Liability for Damage Caused by Space Objects (also known as the Space Liability Convention),¹²⁰ which since 2021 has been an active international convention that imposes absolute liability on governments to pay for any damages caused by the respective nation's space objects to the surface of the Earth or to aircraft.¹²¹ Further development upon Article VII was reflected in the creation of the Convention on Registration of Objects Launched into Outer Space, also known as the Registration Convention.¹²² This treaty mandates that nations register and share space objects for safe tracking and prevention of irresponsible or negligent usage of space vehicles as part of testing, experiments, or usual operations.¹²³

Implementation of an article akin to Article VII of the Outer Space Treaty will most likely help jurisdictions lay foundation on directing accountability. Establishing a framework for liabilities in case of accidents—including flaws in machine-learning artificial intelligence systems—would provide a robust foundation for addressing the accountability gap. Furthermore, the existence of such a clause would motivate and incentivize nation-states to focus on the development of autonomous military systems or rules of engagement that can prevent potential violation of international humanitarian law. Building from the disarmament clauses suggested above, the imposition of liability in case of accidents will encourage nation-states to focus on switching existing LAWS to more humanitarian-focused equipment.

Such applications have always been present in military equipment developments. Just as the same radar used in attack helicopters can be used in search and rescue helicopters, AIs can still unload much burden from human elements of the military in various non-offensive military operations such as search and rescue and reconnaissance. Even if they were to be deployed in offensive missions or guard-post duties, where lethal force may be required, the establishment of a framework like Article VII would allow victims of mistaken distinction or proportionality to bring suit against the military for damages.

¹¹⁹ Outer Space Treaty, *supra* note 103, art. VII.

¹²⁰ Convention on International Liability for Damage Caused by Space Objects, 24 U.S.T. 2389, 861 U.N.T.S. 187, 10 I.L.M. 965 (1972).

¹²¹ *Id.*

¹²² Convention on Registration of Objects Launched into Outer Space, 28 U.S.T. 695, 1023 U.N.T.S. 15, 14 I.L.M. 43 (1975).

¹²³ Frans G. von der Dunk, *The Registration Convention: Background and Historical Context*, 32 SPACE, CYBER, AND TELECOMMUNICATIONS LAW PROGRAM FACULTY PUBLICATIONS 450, 451-52 (2003).

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CONCLUSION

As of the time this paper was written, war continues on in Ukraine and Gaza, and nations continue to seek ways to incorporate artificial intelligence into their military weapon systems.¹²⁴ Without a proper international legal framework to govern the conduct of LAWS on the battlefield, the accountability gap will only widen.

The unfortunate reality of the laws of armed conflict is that foundationally, new laws are adopted only in response to an event resulting in significant casualties. Much of the international humanitarian law discussed in this paper was established in response to the Second World War and the blasphemous results of carpet-bombing, genocides, and urban warfare.

The hope is that the nations develop creative and practical legal measures that would prepare for potential grave harm *before* mass casualties happen. A new international treaty for LAWS—like the Outer Space Treaty that significantly thwarted the grave weaponization of space—would be a great place to begin.

¹²⁴ See generally, Zoe Kleinman & Chris Vallance, *AI ‘Godfather’ Geoffrey Hinton Warns of Dangers as He Quits Google*, BBC NEWS (May 2, 2023), <https://www.bbc.com/news/world-us-canada-65452940> [https://perma.cc/F7VM-7S4S].