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OTONOM SİLAH SİSTEMLERİ VE HAKLI SAVAŞ TEORİSİ: ZORLUKLAR VE ÖNERİLER

AUTONOMOUS WEAPON SYSTEMS AND THE JUST WAR THEORY: CHALLENGES AND IMPLICATIONS

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Özet

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Otonom silah sistemleri (OSS), haklı savaş teorisinin uluslararası hukukta uygulanmasının önünde zorlu bir engel teşkil etmektedir. Haklı savaş teorisi, uzun süredir silahlı çatışmanın ahlaki ve yasal gerekçelerini değerlendirmek için bir çerçeve işlevi görmüş olsa da, OSS'de güç kullanımı üzerinde insan kontrolünün olmaması, benzersiz etik ve yasal zorluklar yaratır. Bu makale, jus ad bellum ve jus in bello kriterlerinin uygulanması da dahil olmak üzere OSS'nin uluslararası hukukta haklı savaş teorisi üzerindeki etkilerini incelemektedir. OSS'nin avantajlarını ve dezavantajlarını, bu sistemler için mevcut yasal çerçeveyi ve haklı savaş teorisi kriterlerini OSS'ye uygulamayla ilgili zorlukları tartışmaktadır. Makale, ek araştırma ihtiyacı, açık yasal çerçevelerin geliştirilmesi, uluslararası işbirliği ve koordinasyon, halkın katılımı ve farkındalığı ve silahlı çatışmada OSS kullanımına yönelik alternatif yaklaşımlar üzerine araştırma dahil olmak üzere, bu zorlukları ele almak için gelecekteki araştırma ve politika geliştirmeye yönelik önerilerle sona ermektedir. Bu kaygıların giderilmesi halinde, araştırmacılar OSS 'nin geliştirilmesi ve kullanılmasının haklı savaş teorisi ve uluslararası hukuk ilkeleriyle tutarlı bir hale getirilmesi mümkündür.

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Abstract

Autonomous weapon systems (AWS) present a formidable obstacle to the application of just war theory in international law. While just war theory has long served as a framework for assessing the moral and legal justification of armed conflict, the lack of human control over the use of force in AWS creates unique ethical and legal challenges. This article investigates the effects of AWS on just war theory in international law, including the application of jus ad bellum and jus in bello criteria. It discusses the benefits and drawbacks of AWS, the current legal framework for these systems, and the difficulties associated with applying just war theory criteria to AWS. The article concludes with recommendations for future research and policy development to address these challenges, including the need for additional research, the development of clear legal frameworks, international cooperation and coordination, public participation and awareness, and research on alternative approaches to the use of AWS in armed conflict. By addressing these concerns, researchers can work toward a future in which the development and use of AWS are consistent with the principles of the just war theory and international law.

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I. INTRODUCTION

Autonomous weapon systems (AWS) are armed systems that can function independently of direct human control[1]. These systems select and engage targets using sensors, artificial intelligence (AI), and computer algorithms. AWS can analyze data and make decisions autonomously, unlike conventional weapons. Unmanned aerial vehicles (UAVs or drones), autonomous ground vehicles (AGVs), and autonomous maritime systems (AMS) are examples of AWS[2].

AWS are significant in contemporary international law due to their potential impact on the conduct of war. Significant ethical, legal, and operational issues are raised by the creation and deployment of AWS. AWS could reduce casualties and improve the effectiveness of military operations[3]. Concerns exist, however, that AWS could result in unintended harm, a loss of control over the use of force, and violations of international humanitarian law. International lawyers, policymakers, and military experts are debating the legal and ethical implications of the increasing use of AWS. The United Nations Convention on Certain Conventional Weapons established an open-ended Group of Government Experts in 2016 with the purpose of examining the characterization of these weapon systems and developing a working definition; however, they have not yet established a universally accepted terminology[4]. The consensus is growing that the existing legal framework, which includes the principles of international humanitarian law (IHL) and human rights law, is insufficient to regulate the use of AWS. Therefore, new legal and ethical guidelines are required to ensure that AWS are developed and used in accordance with the principles of just war theory and the protection of civilian populations. Moreover, the deployment of AWS has substantial geopolitical implications. Utilization of AWS could alter the balance of power between states and increase the probability of conflict. The development of AWS also raises concerns regarding the spread of advanced military technologies and the potential for arms races. The regulation of AWS is therefore not only a matter of international law, but also of global security. The development and use of AWS must be strictly regulated to ensure that they adhere to the principles of just war theory and IHL.

The purpose of this article is to examine AWS from the perspective of just war theory in international law. The article begins with a definition of AWS and a summary of the existing legal framework on their use. The paper then examines the historical evolution of just war theory and its relevance to modern international law, and how the just war theory, including *jus ad bellum* and *jus in bello*, applies to AWS. The article also discusses the difficulties of applying just war theory criteria to AWS, such as the lack of human control over the use of force, the difficulty of programming autonomous systems to comply with just war criteria, and the issue of responsibility and accountability for the use of AWS. The article concludes with a discussion of the implications of AWS for the theory of just war in international law, as well as recommendations for future research and policy development. The purpose of this article is to contribute to the ongoing discussion about the ethical and legal implications of AWS and to provide some guidance for legal scholars.

II. HISTORICAL DEVELOPMENT OF "JUST WAR THEORY"

Just war theory is a set of ethical principles and guidelines that attempts to establish the conditions under which a war is just or morally acceptable. The central premise of the just war tradition is that war should be used to create lasting peace[5]. The tradition of Just War is best understood as the enunciated "norms, customs, professional codes, legal precepts, religious and philosophical principles, and reciprocal arrangements that shape our judgments of military conduct"[6].

Some of these norms and principles can be seen in the collection of international rules and agreements that have governed acceptable behavior in wars and conflicts, including the Geneva Conventions and the Hague Rules ("The Convention on Laws and Customs of War" 1899 and 1907[7]) These intend to place constraints on certain forms of warfare and provide a framework for the application of law in the prosecution of offenders[8]. Prosecution of such offenders were realized by the Nuremberg Tribunal at the end of World War II. There, the emphasis was shifted from vengeance to justice. The Nazis were tried for the crimes they committed during the war[9]. At Nuremberg, the prosecutors did not rely on the law of any particular state, instead, they relied upon the violations of the Hague conventions and internationally accepted standards of

[1] BOOGAARD, Jeroen Van Den: "Proportionality and Autonomous Weapons Systems", Journal of International Humanitarian Legal Studies, 6(2), 2015, p.251.
[2] BOOGAARD, p.255.
[3] BOOGAARD, p.264.
[4] BARBER, Ian Andrew: "Autonomous Weapons Systems & Accountability: Rethinking Criminal Responsibility for War Crimes at the ICC", SOAS Law Journal, 7(1), 2020, p.9; "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", adopted 10 April 1981, entered into force 2 December 1983; CCW, "Report of the 2017 Group of Government Experts on Lethal Autonomous Weapons Systems" (22 December 2017), UN Doc CCW/GGE.1/2017/3 1,7.
[5] MURPHY, James G.: War's ends: human rights, international order, and the ethics of peace, Georgetown University Press, Washington DC 2014, p.22.
[6] STRAWSER, Bradley J.: Killing by Remote Control: The Ethics of an Unmanned Military, Oxford University Press, New York 2013, p.28.
[7] CORDERO, Carlo A.: Lethal Autonomous Weapons and the End of Just War: Awakened Automata or Solemn Simulacra , Aır Unıv Maxwell Afb Al Maxwell Afb, United States 2018, p.9.
[8] CORDERO, p.9.
[9] DRISCOLL, William/ZOMPETTI, Joseph/ZOMPETTI, Susette: The International Criminal Court: Global Politics and the Quest for Justice, International Debate Education Association, New York 2004, p.11.

justice, even if these latter norms had not been formally enshrined as a body of international law. Since then, international bodies such as the International Court of Justice of the United Nations, the International Criminal Court established by the Rome Statute, and other international tribunals have relied on a collection of treaties and agreements on international crimes to decide cases and dispense justice[10]. Contemporary scholars continue to debate and refine the theory as it has evolved over time.

Just war theory is comprised of two parts: *jus ad bellum*, which deals with the justification for going to war, and *jus in bello*, which addresses the conduct of war[11]. The *jus ad bellum* criteria are; a) war must be waged for a just cause, such as self-defense, the defense of innocent people, or the prevention of an unjust attack, b) a war must be declared by a legitimate authority, such as a government or international organization, c) a war must be waged for the right intention, such as the restoration of justice and peace, and not for selfish or aggressive reasons, d) war must be a last resort, employed only when all peaceful means of resolving a conflict have been exhausted, e) the harm caused by the war must be proportional to the good it achieves, f) a war must have a reasonable prospect of success[12]. The qualifications for *jus in bello* are; a) combatants must make a distinction between civilians and military targets and attack only the latter, b) the damage caused by an attack must be proportional to the military objective attained, c) an attack must be necessary to achieve a valid military objective[13].

Just war theory is a framework for assessing the moral and legal justification for wars and the conduct of warfare. It seeks to strike a balance between the need to defend against aggression and promote justice and peace and the need to prevent civilians and combatants from suffering unnecessary harm.

A. The Development of the Theory of Just War from Antiquity to the Present

Ancient Greek and Roman philosophers such as Plato, Aristotle, and Cicero discussed the morality of war[14]. Plato, for instance, argued that war should be waged only as a last resort and that soldiers should not engage in unnecessary violence or plunder. Cicero argued that war should only be waged for just reasons, such as self-defense or the protection of allies.

During the Middle Ages, Christian theologians such as Augustine and Aquinas sought to reconcile the morality of warfare with the teachings of the Christian faith and contributed to the development of just war theory. Augustine argued that war was a necessary evil[15] and that it could only be justified in self-defense or the punishment of wrongdoers. Aquinas elaborated on Augustine's ideas and developed the concept of *jus ad bellum*, which specifies the conditions under which a war can be deemed just. Aquinas outlined three requirements for a just war, such as that the main purpose of a war has to be the creation of peace[16], only the legitimate government of an independent nation can declare war and then carry it out and it must be absolutely necessary. To achieve a just peace and a just order of things in which each nation is given its due, war must be fought with the right intention[17].

Just war theory continued to develop and adapt to new circumstances and challenges in the modern era. The evolution of international law and the rise of modern warfare have generated new debates and difficulties for the application of the just war theory. For instance, the proliferation of nuclear weapons and other forms of mass destruction has prompted some scholars to question the morality of warfare in general, while others have argued that just war theory must be revised to account for these new realities. The role of non-state actors in conflict, the use of military drones and other autonomous weapons, and the impact of new technologies on the warfare itself have also been the subject of recent debates regarding just war theory. Therefore, just war theory continues to be a dynamic and evolving field, as scholars and policymakers strive to strike a balance between the need to defend against aggression and promote justice and peace and the need to avoid causing unnecessary harm to civilians and combatants.

B. Contemporary Relevance of Just War Theory to International Law

Just war theory remains a crucial framework for assessing the moral and legal justification for wars and the conduct of warfare in contemporary international law. Various international legal instruments, such as the United Nations Charter, which prohibits the use of force except in self-defense[18] or with the authorization of the UN Security Council, reflect the principles of just war theory. To this end, the United Nations (and by extension, the entire organization) is empowered by Article 1 of the Charter to take "effective collective measures", "to prevent and eliminate threats to the peace and to suppress acts of

[10] LEE, Roy S.: The International Criminal Court: The Making of the Rome Statute: Issues, Negotiations and Results, Kluwer Law International, The Hague 2002, ix; CORDERO, p.9.
[11] WALZER, Michael: Haklı Savaş Haksız Savaş: Tarihten Örneklerle Desteklenmiş Ahlaki Bir Tez, Çeviren DOĞAN, Mehmet, Boğaziçi Üniversitesi Yayınevi, İstanbul 2010, p.47.
[12] FREIBERGER, Erich: "Just War Theory and the Ethics of Drone Warfare", E-International Relations, 2013, p.1-2.
[13] FREIBERGER, p.2.
[14] FREIBERGER, p.1.
[15] RYCHLAK, Ronald J.: "Just War Theory, International Law, and the War in Iraq", Ave Maria Law Review, 2, 2004, p.5.
[16] RYCHLAK, p.5.
[17] RYCHLAK, p.6.
[18] Using or threatening to use force is prohibited by Article 2(4) of the United Nations Charter, with the exception of self-defense and enforcement actions authorized by the UN Security Council . For the just war theory developed after World War II, some academics use the term "jus contra bellum" instead of "*jus ad bellum*." SPINDLER, Zsolt: "Just War Theories from *Jus Ad Bellum* to Jus Post Bellum-Legal Historical and Legal Philosophycal Perspectives", Kazan University Law Review, 4(4),2019, p.239; TAYLOR, M. J.: "Just Obsolescence: Is Just War Theory Still Relevant in the 21st Century?", Manchester Review of Law, Crime and Ethics, 10, 2021, p.181.

aggression or other breaches of the peace"[19]. The criteria of the theory of just war are also reflected in the laws of war, which regulate the conduct of warfare and seek to minimize harm to civilians and combatants. These laws include the Geneva Conventions of 1949[20] and their Additional Protocols[21], which outline the responsibilities of combatants, as well as providing protections to civilians and prisoners of war[22].

The principles of just war theory continue to inform contemporary debates surrounding emerging issues in international law, such as the use of drones and other AWS. These new technologies raise questions regarding the distinction between combatants and civilians, the proportionality of attacks, and the justification for the use of force. Hence, just war theory has significant implications for the evolution of international humanitarian law[23], and the promotion of international peace and security. Just war theory can promote greater accountability and transparency in military operations and ensure that the use of force is a last resort by providing a framework for evaluating the moral and legal justifications for wars and the conduct of warfare.

III. AUTONOMOUS WEAPON SYSTEMS

A. Definition and Types of Autonomous Weapon Systems

AWS (AWS) are weapons that use artificial intelligence (AI) algorithms and other advanced technologies to identify and engage targets without human intervention or control[24], Unlike traditional weapons, which require a human operator to pull the trigger or launch the weapon, AWS are programmed to decide when and how to use lethal force[25].

There are several types of AWS, which include:

UAVs (Unmanned Aerial Vehicles), also known as drones: These are remotely or autonomously controlled aircraft that are used for a variety of military and civilian purposes such as reconnaissance, surveillance, and targeted killings. UAVs, which are usually remotely controlled by a human counterpart, have become increasingly important in warfare over the past decade.

Autonomous ground vehicles[26]: These are vehicles that operate on land, such as tanks or other armored vehicles, and are outfitted with AI algorithms and other technologies that allow them to navigate and engage targets without the need for human intervention.

Autonomous naval vessels are ships and other types of sea vessels that are outfitted with advanced technologies that allow them to operate independently or semi-independently without the need for human intervention.

Autonomous weapons are weapons which are designed to operate autonomously or semi-independently[27], without the need for human intervention, such as missile systems that can identify and engage targets on their own.

The development and use of AWS raises significant ethical, legal, and strategic concerns, particularly the potential for these systems to cause harm to civilians, to reduce accountability and transparency in military operations, and to shift the power balance between states and non- state actors. As a result, the use of AWS is the subject of ongoing debate and discussion within the international community, with some arguing for a ban or moratorium on their use, while others advocating for their continued development and deployment.

[19] The United Nations, "The Charter of the United Nations", 1945, Article 1.
[20] "Convention (I) for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field. Geneva", 12.08.1949; "Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea. Geneva", 12.08.1949; "Convention (III) relative to the Treatment of Prisoners of War. Geneva", 12.08.1949; "Convention (IV) relative to the Protection of Civilian Persons in Time of War. Geneva", 12.08.1949, https://ihl-databases.icrc.org/en/ihl-treaties/geneva-conventions-1949additional-protocols-and-their- commentaries, (Accessed: 18.02.2023).
[21] "Protocol Additional to the Geneva Conventions of 12.08.1949 and relating to the Protection of Victims of International Armed Conflicts" (Protocol I), 8.06.1977; "Protocol Additional to the Geneva Conventions of 12.08.1949, and relating to the Protection of Victims of Non-International Armed Conflicts" (Protocol II), 8.06.1977; "Protocol additional to the Geneva Conventions of 12.08.1949, and relating to the Adoption of an Additional Distinctive Emblem" (Protocol III), 8.12. 2005, https://ihl-databases.icrc.org/en/ihl-treaties/geneva-conventions- 1949additional-protocols-and-their-commentaries, (Accessed: 18.02.2023).
[22] DREMLIUGA, Roman: "General Legal Limits of the Application of the Lethal Autonomous Weapons Systems within the Purview of International Humanitarian Law", Journal of Politics and Law, 13(2), 2020, p.117.
[23] DREVESKRACHT, Ryan: "Just War in International Law: An Argument for a Deontological Approach to Humanitarian Law", Buffalo Human Rights Law Review, 16, 2010, p.237-288.
[24] BOOGAARD, p.251.
[25] TOSCANO, Christopher P.: "Friend of Humans: An Argument for Developing Autonomous Weapons Systems", Journal of National Security Law and Policy, 8(1), 2015, p.192.
[26] OZGUNER, Umit/ACARMAN,Tankut/REDMILL, Keith Alan: Autonomous Ground Vehicles, Artech House, Norwood MA 2011.
[27] HAMMOND, Daniel N.: "Autonomous Weapons and the Problem of State Accountability", Chicago Journal of International Law, 15(2), 2015, p.659.

B. Advantages and Disadvantages of Autonomous Weapon Systems

1. Advantages[28]

One of the primary benefits of AWS is their potential to operate more efficiently and effectively than conventional weapons. AWS are able to make accurate and prompt decisions regarding the use of lethal force, which could reduce the time required to respond to threats[29]. By removing human operators from the battlefield, AWS could reduce the risk of injury and death and prevent casualties. As an illustration, the distance between the combatants will be far. By employing this approach, the adversary's ability to inflict harm against someone will be impeded, or at the very least, the extent of such harm will be diminished[30]. By employing cutting-edge technologies such as artificial intelligence, machine learning, and computer vision, AWS is able to differentiate between combatants and civilians more accurately and reduce collateral damage. Moreover, AWSs possess some potential advantages in comparison to humans[31]. These advantages encompass enhanced sensory and computational capabilities, the absence of emotional factors such as fear and wrath, and the capacity to effectively monitor and report instances of unethical conduct in military operations[32]. An AWS possesses the capability to access a greater amount of information pertaining to the value of a target. Consequently, it is equipped to make a more informed assessment regarding matters such as proportionality, even in time-sensitive situations[33]. Despite the absence of inherently human qualities like empathy, AWS is capable of adhering to the principles and regulations governing battle.

Regardless of opinions on the overall capabilities of AWS, there are instances where utilizing AWS can be a flawless experience. Consider a hypothetical scenario wherein a remotely operated autonomous underwater vehicle is deployed within a secluded aquatic environment, devoid of any human presence[34]. The likelihood of the submarine contravening international humanitarian law is exceedingly minimal. This scenario represents the optimal outcome, although it serves as a broader illustration of the varying effectiveness and legitimacy of AWSs, contingent upon certain conditions[35]. In this regard, AWSs exhibit distinctions from certain armaments that have been proscribed by the global community, including imperceptible components and incapacitating laser weapons that inflict unwarranted suffering irrespective of their manner of deployment[36]. In the foreseeable future, it is plausible that AWSs might potentially be deployed for urban surveillance and combat target identification. However, at present, it may be more prudent to confine their operations to controlled environments or restrict their usage to defensive purposes exclusively. Regardless, the necessity for well-defined guidelines does not constitute a justification for complete prohibition. Instead of imposing extensive restrictions on AWSs, it is advisable for international law to acknowledge their potential permissive usage in specific contexts, thereby enhancing the regulatory framework[37].

2. Disadvantages:[38]

One of the disadvantages is the potential impossibility of attaining a comprehensive understanding of the risks associated with AWS. It is often challenging for programmers to precisely forecast the behavior of computer-based systems. In addition, it is important to note that computer-based systems may have system malfunctions, part failures, and internal problems. Furthermore, the advent of sophisticated technology presents the potential for "emergent behaviors," which refer to actions that are not explicitly intended but occur as a result of the intricate nature of the system[39].

One of the primary disadvantages of AWS is its lack of human control (completely or partially[40]) and judgment. This suggests that AWS may be unable to differentiate between combatants and noncombatants[41]

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[28] SCHMITT, Michael N./THUMBER, Jeffrey S.: "Out of the Loop: Autonomous Weapon Systems and the Law of Armed Conflict", Harvard National Security Journal, 4(2), 2013, p.235; CASS, Kelly: "Autonomous Weapons and Accountability: Seeking Solutions in the Law of War", Loyola of Los Angeles Law Review, 48(3), 2015, p.1027-1028; MA, Erica H.: "Autonomous Weapons Systems under International Law", New York University Law Review, 95(5), 2020, p.1444-1445.

[29] In numerous scenarios, robots exhibit superior reaction times and more precise targeting abilities compared to human. SINGER, Peter W.: "Military Robots and the Laws of War", The New Atlantis, 23, 2009, p.29.

[30] GÜNEYSU, Gökhan: "Yeni Silahların Tabi Tutulması Gereken Hukukîlik Denetimi ve Otonom Silah Sistemleri", Düşünce Dünyasında Türkiz, 14(1), 2023, p.98.

[31] LEWIS, Johin: "The Case for Regulating Fully Autonomous Weapons", Yale Law Journal, 124(4), 2015, p.1315.

[32] LEWIS, p.1315.

[33] LEWIS, p.1315.

[34] LEWIS, p.1315.

[35] LEWIS, p.1315.

[36] LEWIS, p.1315.

[37] LEWIS, p.1315.

[38] MA, p.1446; CASS, p.1028; ARKIN, Ronald C.: "The case for ethical autonomy in unmanned systems", Journal of Military Ethics, 9(4), 2010, p.333; MARCHANT, Gary E./ALLENBY, Braden/ARKIN, Ronald/BARRETT, Edward T.: "International Governance of Autonomous Military Robots", Columbia Science and Technology Law Review, 12, 2011, p.282-284.

[39] CASS, p.1029

[40] KAISER, Stefan A.: "Legal Challenges of Automated and Autonomous Systems", German Yearbook of International Law, 60, 2017, p.175.

[41] HOROWITZ, Michael C.: "The Ethics & Morality of Robotic Warfare: Assessing the Debate over Autonomous Weapons", Dædalus, the Journal of the American Academy of Arts & Sciences, 145(4), 2016, p.28.

There is a significant status difference between combatants and non-combatants. Combatants are protected only if they are wounded and prison. Non-combatants always receive protection; but like captive combatants, they will not be protected if they join the war. Those who are considered "combatants" in international armed conflicts are explained in Article 4 of the Geneva Convention relative to the Treatment of Prisoners of War.

or make nuanced decisions regarding the use of lethal force. Concerns regarding accountability and transparency in military operations are also raised by the use of AWS. Because AWS can operate autonomously, it may be difficult to determine who is responsible for their actions and hold individuals accountable for war crimes and other violations of international law. The use of AWS increases the likelihood of proliferation and escalation in conflicts. Because AWS can operate more efficiently and effectively than conventional weapons, they may lower the threshold for the use of force and increase the likelihood of conflict escalation. There are also ethical concerns regarding the use of AWS, particularly regarding the potential for these systems to cause harm to civilians and violate the principles of just war theory. For instance, the use of AWS may raise questions regarding the proportionality of attacks, the necessity of using force, and the differentiation between combatants and noncombatants[42].

C. Current Some Legal Framework for Autonomous Weapon Systems

There is currently no international convention or treaty that regulates the development and use of AWS. Nonetheless, the following international legal frameworks apply to AWS: The UN Charter establishes the fundamental principles of international law governing the use of force by states. Article 2(4) of the Charter[43] prohibits states from using force against another state other than in self-defense or with the authorization of the United Nations Security Council. Until the United Nations Security Council takes action to restore international peace and security, the Charter of the United Nations does not limit the inherent rights of states to self- defense[44].

Furthermore, in accordance with the principles of just war, *jus in bello*, states' military responses must be proportional to the severity of the threat, and make a clear distinction between military and non-military targets. During hostilities, the belligerents are not free to use any means or methods of warfare they see fit. This fundamental principle of IHL applies equally to both international and non-international armed conflicts[45]. The codification of customs and traditions pertaining to land war took place during the 1899 The Hague Conference. The Annex to this regulation deals with wars at sea; In addition, the use of certain weapons (especially suffocating gases) is prohibited by three declarations. The 1907 Hague Conference resulted in 13 documents. The first three Conventions review existing texts on the wounded, sick, and prisoners of war. Fourth Convention is about the protection of the civilian population. These provisions include principles based largely on custom. The 1899 and 1907 Conventions establish the IHL rules that govern the conduct of armed conflict[46]. Additional Protocol I (Relating to the Protection of Victims of International Armed Conflicts) to the Geneva Conventions of 1949[47] is widely regarded as the legal document setting out the parameters within which armed conflicts must be conducted[48].

Since all forms of warfare fall under the purview of the rules of war, autonomous weapons systems would be no exception. These agreements are applicable to all types of weapons, including AWS. The ability of lethal AWS to comply with the IHL principles of distinction such as military necessity and proportionality is at the center of much of the debate over the legal implications of AWS[49]. In this respect, the answer to the question of what a competent and conscientious human soldier should do to distinguish between combatants and protected persons relies not on readily apparent distinctive signs like military uniforms but on people's "behavior and actions on the battlefield", since it is difficult to determine who is who in a battlefield. It is highly unlikely that AWS will ever reach the level of intelligence and perception required to comply with such deliberations which is deemed necessary by the IHL[50]. This involves recognizing body postures and gestures, comprehending facial expressions, and judging intentions and actions in real-time in the context of unstructured warfare scenarios[51].

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[42] Check out for additional information regarding proportionality and autonomous weapons systems. BOOGAARD, p.247-283.
[43] "The United Nations Charter", article 2(4).
[44] WARREN, Aiden/HILLAS, Alek: "Decreasing Unintentional War: Governance Considerations for Regulating Lethal Autonomous Weapons Systems", Penn State Journal of Law and International Affairs, 9(2), 2021, p.81.
[45] FLECK, Dieter: "The Law of Non- International Armed Conflicts", The Handbook of International Humanitarian Law, 2nd edition, Oxford University Press, Oxford 2008, p.1203.
[46] All the fundamental rules governing the conduct of hostilities are customary, according to a study done in 2005 by the International Committee of the Red Cross. The use of indiscriminate weapons is forbidden, for example, and there should be a reasonable relationship between the goals and the means used in an attack.
[47] ROSE/OSWALD, p.425-427.
[48] According to the ICJ's Nuclear Weapons Advisory Opinion (1996), "the Court recalls that all States are bound by those rules in Additional Protocol I which, when adopted, were merely the expression of the pre-existing customary law," specifically referencing the Martens Clause, which was reaffirmed in the first article of Additional Protocol I. The so-called Martens Clause states that the "principles of humanity" and the "dictates of public conscience" shall be binding in situations where the Protocol remain incapable, "Legality of the Threat or Use of Nuclear Weapons", Advisory Opinion, 1996, ICJ Rep 226; MERON, Theodor: "The Martens Clause, principles of humanity, and dictates of public conscience", American Journal of International Law, 94(1), 2000, p.83-85; EGELAND, p.92.
[49] HEYNS, Christof: "Report of the Special Rapporteur on Extrajudicial, Summary, and Arbitrary Execution, United Nations Human Rights Council", 23/47, 9. 4. 2013, paras 63-74; AKERSON, David: "The Illegality of Offensive Lethal Autonomy", SAXON, Dan, International Humanitarian Law and the Changing Technology of War, Brill, 2013, p.65.
[50] In fact, Articles 4 and 5 of the Geneva Convention(III) should be examined. Carrying an externally visible emblem is extremely important in the distinction between combatants and civilians. Here, it is aimed to emphasize that the emblem cannot be detected by AWS. In addition, the provisions of Articles 45 and 51 of Protocol Additional to the Geneva Conventions I can be referred to regarding the situation called "unlawful combatant" in international practice.
[51] ALSTON, Philip: "Lethal Robotic Technologies: The Implications for Human Rights and International Humanitarian Law", Journal of Law, Information and Science, 21(2), 2011, p.35-60; GEISS, Robin: "The international-law dimension of autonomous weapons systems", International Policy Analysis, Friedrich-Ebert- Stiftung, 2015,14.

In conclusion, despite the existence of relevant international rules, the problems regarding appropriate legal and ethical frameworks for AWS are the subject of ongoing debate and discussion. Some argue that the existing legal frameworks are adequate to regulate AWS, while others argue that new treaties or conventions are necessary to address the unique challenges posed by these technologies. In addition, some states have taken unilateral measures to restrict or prohibit the development and use of AWS, such as South Korea's 2020 ban on fully autonomous weapons.

IV. JUST WAR THEORY CRITERIA APPLIED TO AUTONOMOUS WEAPON SYSTEMS

A. *Jus ad Bellum* Criteria

Regarding the application of *jus ad bellum* criteria to AWS, there are a number of important considerations. One of the most important questions regarding the use of AWS is whether or not they can be used to wage a just war. There are concerns that the lack of human judgment[52] and control could lead to the use of lethal force in situations that do not meet the criteria for a just war. In this respect, the question of whether or not AWS are used as a last resort is also a significant concern. Some argue that the use of AWS could lower the threshold for the use of lethal force, as they could be employed in situations where human operators would not be willing to employ lethal force.

The proportionality criteria for the use of AWS is also an important factor. For there to be proportionality, states must weigh the benefits of their military actions against the costs[53]. As in the former criteria, there is a similar concern that the lack of human judgment and control could lead to disproportionate use of force, even though AWS may be able to more precisely target combatants and minimize harm to civilians.

The question of whether or not the use of AWS has a reasonable chance of success is also a source of concern. Even though AWS may be more efficient and effective than conventional weapons, some argue that they may be incapable of achieving the objectives of a just war without human intervention.

Also, the *jus ad bellum* requires that any use of force to be authorized by a legitimate authority, making legitimate authority a crucial criterion. Non-state actors lack the authority to engage in armed conflict. Only properly recognized authorities (or sometimes legitimate authority) can declare war[54]. Non-state actors are a major concern in the debate over the legitimacy of authority. The international legal system, for instance, imposes obligations on these actors but grants them no special rights. In the just war tradition, non-state actors are not legitimate authorities, even though states have the right to operate militarily against them[55]. Consequently, in terms of legitimate authority: Who is authorized to employ AWS? One of the most important questions, here, is whether the use of AWS requires the approval of a human operator or whether the AWS can operate autonomously without human intervention. If AWS are programmed to act autonomously, questions arise regarding: Who is liable for any damage caused by their use? Who is accountable for AWS' actions? Who is responsible for the actions of AWS? Therefore, if AWS acts autonomously, the answer to the questions on accountability and responsibility for their actions has to be answered by taking into account the programmer, the operator and the state.

In conclusion, when it comes to the use of AWS, there are intricate ethical, legal, and strategic concerns. As a result, the international community continues to debate and discuss the appropriate legal and ethical frameworks for the development and use of these technologies, as well as how to ensure that their use is consistent with international law.

B. *Jus in Bello Criteria*

Jus in bello criteria, which governs the conduct of hostilities in armed conflict, consist of the principles of distinction, proportionality, and necessity[56]. The principles are based on a compromise between strict military necessity and basic human decency[57]. In other words, these principles are intended to ensure that the use of force is effective, moral, and minimizes harm to civilians and civilian property[58].

Concerning AWS, there are a number of important issues to consider in applying the principles of distinction, proportionality, and necessity. First of all, the principle of distinction requires that the use of force be limited to legitimate military targets and that civilians and civilian objects not be intentionally targeted. Yet, there is always a risk that AWS may not be able to differentiate between combatants and civilians, or that they may be programmed to target specific types of individuals or groups without regard to their status as combatants or civilians. Consequently, the use of AWS may result in indiscriminate harm to noncombatants.

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[52] AMOROSO, Daniele: "Jus in bello and jus ad bellum arguments against autonomy in weapons systems: A re- appraisal", Questions of International Law, 4(43), 2017, p.23-24.
[53] ROFF, p.51.
[54] VON ELBE, Joachim: "The evolution of the concept of the just war in international law", American Journal of International Law, 33(4), 1939, p.665.
[55] CLAPHAM, Andrew: "Human rights obligations of non-state actors in conflict situations", International Review of the Red Cross, 88(863), 2006, p.491-523.
[56] MARCHANT et. al, p.284-285; GRUT, Chantal: "The challenge of autonomous lethal robotics to international humanitarian law", Journal of Conflict and Security Law, 18(1), 2013, p.5-23; WINTER, Elliot: "The Compatibility of Autonomous Weapons with the Principles of Distinction in the Law of Armed Conflict", International & Comparative Law Quarterly, 69(4), 2020, p.845–876.
[57] KIAKALAYEH, Mahshid Talebian: "International Humanitarian Law and Artificial Intelligence: A Canadian Perspective", PhD dissertation, University of Windsor, Canada 2022, p.2.
[58] SOLIS, Gary D.: The Law of Armed Conflict, Cambridge University Press, Cambridge 2010, p.250-286.

The principle of proportionality stipulates that the use of force must be proportional to the military objective and that damage to noncombatants and civilian property must not be disproportionate to the military advantage gained. Under normal circumstances, a military leader must call off or delay an attack if it's likely that civilians will be killed, injured, or their property will be destroyed at a rate that's out of proportion to the expected military benefit[59]. With AWS, however, there is a possibility that they may cause harm that is disproportionate to the military objective, or that they may cause harm to noncombatants or civilian objects that is disproportionate to the military advantage gained.

According to the principle of necessity, the use of force must be required to achieve the military objective and all other means of achieving that objective must have been exhausted[60]. There is a possibility that AWS could be used without a clear military objective, or when other means of achieving the objective are still available. This raises concerns regarding the risk of harm to noncombatants and civilian objects, which could be avoided by employing alternative methods.

In conclusion, the principles of distinction, proportionality, and necessity are fundamental to the ethical and effective use of force in armed conflict, and they are applicable to the employment of AWS. There are ongoing debates and discussions within the international community regarding the use of these technologies consistent with international humanitarian law.

V. CHALLENGES TO APPLYING JUST WAR THEORY CRITERIA TO AUTONOMOUS WEAPON SYSTEMS

A. Lack of Human Control Over the Use of Force

The lack of human control over the use of force is one of the most difficult aspects of applying the principles of just war theory to AWS. AWS are designed to operate without direct human input or control and are capable of independently deciding when to use force[61]. From a just war theory standpoint, this lack of human control raises several concerns.

Human actors are accountable for their actions on the battlefield and can be held accountable for violations of international law in conventional warfare. One of the tenets of just war theory is that the decision to use force must be based on human judgment. Before deciding to use force, human operators are able to consider a variety of factors, such as the status of the target and the potential risks to noncombatants. On the other hand, AWS relies on algorithms and programming to make decisions regarding the use of force[62], which may not be able to take into account the full spectrum of ethical and legal considerations.

Again, with AWS, there are also problems with regard to the principles of proportionality and discrimination. The system may not be able to consider the full range of factors that a human operator would consider in terms of these principles[63].

In conclusion, the lack of human control over the use of force with AWS poses substantial obstacles to the application of just war theory criteria.

B. Difficulty in Programming Autonomous Weapon Systems to Comply with Just War Criteria

Just war theory requires that the use of force must be proportionate, necessary, and discriminate in its effects. However, it is difficult to program an autonomous weapon system to make decisions based on these criteria. Programming a system to recognize and differentiate between combatants and noncombatants, for instance, requires the ability to recognize and analyze a variety of visual, auditory, and other sensory data. This is a complex and difficult task, as it can be difficult to distinguish between combatants and noncombatants in certain contexts[64]. Likewise, programming a system to evaluate the proportionality and necessity of the use of force necessitates the ability to make complex judgments regarding the strategic and tactical context of the conflict. This may involve taking into account factors such as the status of the target, the nature and magnitude of the threat, and the potential risks to non-combatants. In addition, programming an AWS to comply with just war theory criteria raises complex ethical and legal concerns. This may be in conflict with the principle of discrimination if, for instance, a system is programmed to prioritize the safety of its own troops over other considerations, such as the potential harm to noncombatants.

In conclusion, coding AWS to comply with just war theory requirements poses a significant technical and ethical challenge. While it may be possible to program these systems to comply with certain aspects of the theory of just war, there are significant limitations and risks associated with relying on autonomous decision-making in armed conflict.

C. Responsibility and Accountability for the Use of Autonomous Weapon Systems

The issue of responsibility and accountability for the decisions made by AWS is a further difficulty when applying just war theory criteria to AWS. It is unclear, however, who should be held accountable when an AWS violates the relevant criteria.

One issue is the possibility of programming or operational errors or malfunctions in an AWS. If an AWS made a mistake, it is unclear who should be held liable for the resulting harm. The potential for

[59] BOOGAARD, p.260.
[60] BLANCHARD, Alexander/TADDEO, Mariarosaria: "Jus in bello Necessity, The Requirement of Minimal Force, and Autonomous Weapons Systems", Journal of Military Ethics, 2023, p.4.
[61] CASS, p.1022.
[62] CASS, p.1025.
[63] CASS, p.1035.
[64] CASS, p.1035.

intentional misuse or abuse of AWS is another concern. Who should be held accountable if an AWS were used in a way that violated just war theory criteria, such as by targeting civilians or using disproportionate force, is unclear[65]. The individuals who programmed or deployed the system could be held liable, but the extent to which they should be held liable for the actions of an autonomous system is unclear. Existing legal frameworks, such as the principles of command responsibility and the duty to supervise, may be modified to address the use of AWS, according to some. Others have advocated for new legal and ethical frameworks that explicitly address the unique challenges that these technologies pose. The appropriate legal and ethical frameworks for addressing these issues are necessary.

VI. CONCLUSION

This article analyzes the application of just war theory to questions emerging from the operation of AWS in terms of international law. Just war theory has long guided the ethical and legal use of force in armed conflict. The *jus ad bellum* criteria—just cause, legitimate authority, and right intention—and *jus in bello* criteria—distinction, proportionality, and necessity—were discussed. Just war theory requires human control over force and these criteria are difficult to enforce without human control. The article highlighted the challenges of applying these criteria to AWS, including the lack of human control over force, the difficulty of programming AWS to comply with just war criteria, and the issue of responsibility and accountability for AWS decisions. Just war criteria are difficult to apply to autonomous systems because it is unclear who is responsible for their actions. Since AWS cannot make ethical decisions or consider the context of a conflict, programming it to comply with just war criteria is difficult. AWS's accountability for its decisions is unclear, making it a major obstacle. A nuanced and thoughtful approach is needed to ensure that AWS use is compatible with legal and ethical requirements of just war theory.

AWS also complicates the theory of just war by making the issues of responsibility and accountability difficult. As these systems become more autonomous, it becomes harder to determine who is responsible for AWS decisions that harm civilians or violate just war criteria. Applying just war theory to AWS emphasizes the need for ongoing debate and discussion about the best legal and ethical frameworks for regulating these systems. There is no consensus on how to regulate AWS, but any framework must be carefully crafted to ensure ethical and legal use. AWS's complex legal and ethical implications for international law's just war theory requires ongoing research and policy development.

Clear legal frameworks for AWS development and use in armed conflict must be consistent with just war theory. Such frameworks must address the problem of human control over force, as well as the issues regarding accountability and responsibility for AWS decisions. AWS development and deployment must be regulated globally. States, non-state actors, and international organizations must cooperate and create clear international legal frameworks to use these systems. As AWS grows, public awareness of its legal and ethical implications is needed. This necessitates civil society, academic, and public participation in AWS use. In addition, research in non-lethal technologies and human-machine decision-making can inform policy and illuminate AWS's ethical and legal implications.

Addressing the legal and ethical implications of AWS in armed conflict requires ongoing research, policy development, international cooperation, and public participation. These steps can help researchers make AWS use consistent with just war theory and international law.

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