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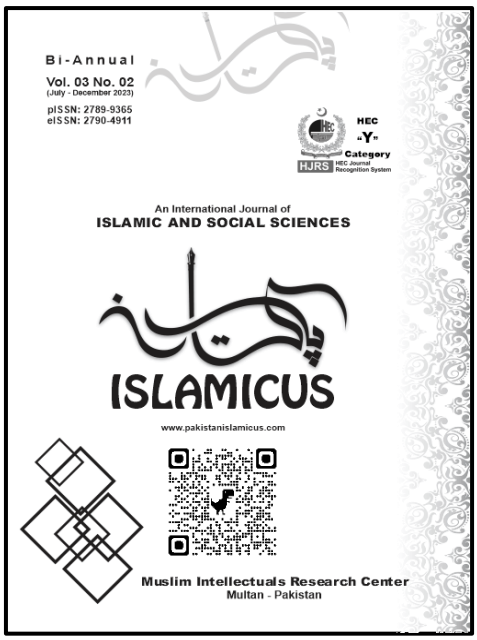

TOPIC

ROBOTS AND INTERNATIONAL LAW: NAVIGATING THE LEGAL LANDSCAPE

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ROBOTS AND INTERNATIONAL LAW: NAVIGATING THE LEGAL LANDSCAPE

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Abstract

Integrating robotics and artificial intelligence into military operations has raised complex legal questions regarding their compliance with international law. This paper delves into the multifaceted relationship between robots and international legal norms, exploring their implications in various domains. The study categorizes robotic weapon systems into three classifications based on human involvement: Human in Loop, Human On Loop, and Human Out of Loop systems. It scrutinizes the compliance of these systems with international laws, including International Human Rights Law, with a focus on humanity, the right to life, bodily integrity/security, due process rights, the right to remedy, and the extraterritorial application of human rights. Furthermore, the paper investigates the intersection of robots with International Humanitarian Law. It examines their impact on other international legal regimes, such as the Law of the Sea and Space Law. The analysis extends to the relevance of domestic legal frameworks in governing robotic technologies. By synthesizing these perspectives, this research contributes to a deeper understanding of the legal challenges posed by robots today. Ultimately, it highlights the need for a nuanced and comprehensive approach to ensure that robots comply with international law while serving various societal functions.

Keywords: Autonomous Systems**,** Compliance**,** Human Rights**,** International Law**,** Robotics

Introduction

The world robots are also known as robotic weapon systems, autonomous robotic systems, killer robots, Artificial Intelligence (AI), lethal robots' killer, Autonomous Weapons Systems

(robots), Unmanned Aerial Vehicles (UAV), and robotic technologies. The progression of weapons has witnessed notable advancements, leading to an increasing divergence of human involvement from the actual battlefield. It might be argued that there is a growing trend towards increased autonomy in weaponry. The phenomenon of incorporating autonomous functionalities into weapons has been seen for a considerable period. Throughout WW-II, the German military employed Zaunköning torpedoes. The weapons above are classified as acoustic torpedoes, which can locate their intended targets by using sound waves upon deployment. Significant transformations have occurred since that time. In contemporary times, there exist weaponry systems wherein a pilot assumes a seated position within a control room, enabling them to operate an uncrewed aerial vehicle (UAV) remotely, sometimes referred to as a *"drone,"* to execute lethal targeting missions in geographically distant regions. Contemporary weapon systems currently necessitate a certain degree of human involvement; nevertheless, the forthcoming advancement in weapon systems entails eliminating human participation from the operational process. This stage represents a significant advancement in the development of entirely autonomous robot systems (Avliyoqulov, 2023).

The Concept of Robotic Autonomous Systems

The term *"autonomous"* originates from the Greek words *"auto,"* meaning *"self,"* and *"nomos,"* meaning *"law."* This implies that individuals possess the ability to control themselves. According to the Oxford Dictionary, "self-determination" is defined as the state or condition of possessing the autonomy to rule oneself or exercise control over one's affairs. Throughout history, there has been a lack of comprehensive efforts to establish a precise definition for the term "autonomous." However, the US Department of Defense (DOD) first provided a definition during their research endeavors in this domain. They defined autonomous systems as those that, once activated, possess the capability to independently select and engage targets without requiring further intervention from a human operator. The Department of Defense (DOD) 's definition has caused ambiguity because of its broad scope encompassing multiple weapon systems (Wagner, 2019).

In contrast, Human Rights Watch (HRW) endeavored to define the concept by considering the level of autonomy, which refers to the extent of human involvement or control, to classify the diverse range of robotic systems. The classifications mentioned above encompassed three distinct dimensions: *human in the loop, human on the loop,* and *human out of the loop*. According to Human Rights Watch, the initial group of individuals excluded from decision-making processes is those robot systems that can autonomously select targets and employ force

without human input or interaction. On the other hand, individuals who fall under the category of being *"on the loop"* are those who can select targets and employ force while being supervised by human operators, who retain the authority to override the actions of the robots. The two types can be classified as fully autonomous weapon systems, characterized by limited human oversight to the extent that the weapon can be deemed *out-of-the-loop* (Thurnher, 2013).

According to the International Committee of the Red Cross (ICRC), robotic weapon systems can be defined as autonomous systems that possess the capability to automatically search for, identify, and engage targets without requiring any form of human intervention. These systems are commonly referred to as *"killer robots."* Currently, military personnel are employing many types of weaponry that possess autonomous capabilities in executing crucial tasks and engaging hostile targets. For example, certain defensive weapons possess an autonomous mode that enables them to intercept attacking missiles, rockets, artillery shells, or aircraft at close proximity. Currently, these weapons exhibit a tendency to be affixed in position and function independently for short durations, within limited contexts (such as areas with relatively low civilian presence or absence of civilian items), and against specific types of targets (namely, primarily ammunition or vehicles). Nevertheless, it is plausible that forthcoming robotic weapon systems will function beyond constrained and artificial spatial and temporal boundaries, confronting a diverse range of rapidly evolving situations and potentially directly targeting persons (Grut, 2013).

Robots represent sophisticated warfare systems that embody enhanced iterations of their predecessors. The human involvement in these systems can be categorized into three distinct groups, wherein the level of human participation is delineated by a concept known as a loop. The outcome is contingent upon the individual's level of involvement in the process, namely whether they are actively engaged, passively observing, or wholly disengaged.

Human In Loop: The concept of "*human in the loop"* refers to a human operator's involvement in an unmanned vehicle's decision-making process. In this context, the unmanned vehicle utilizes its autonomous capabilities to effectively engage predetermined individual targets or groupings of targets, as directed by the human operator prior to the mission. The distinction between human-in-the-loop killer robots and drones is in their operational control. Unlike drones, which are directly controlled by operators, human-in-the-loop killer robots operate autonomously, following orders provided by the operator. Illustrations of such armaments encompass guided munitions, including projectiles, bombs, missiles, torpedoes, and analogous

weaponry that can autonomously navigate toward their designated targets after being discharged, deployed, or initiated.

Human On Loop: The second level refers to systems that possess a degree of autonomy, allowing them to operate with minimal human interaction. These systems exhibit a more comprehensive range of behavior than pre-programmed systems, as they do not rely on continuous human intervention to navigate their tasks. However, in some scenarios, when complexity arises in its operation, human assistance becomes necessary. This includes tasks such as targeting and occasionally initiating the weapon. Currently, these types of systems are being employed in contemporary defense systems.

Human Out of Loop: In contrast to other remotely operated or automated systems, killer robots possess the unique characteristic of operating independently from human supervision immediately following their deployment. The primary distinction between this particular type of weapon and other automated weapons lies in their respective features. These weapons have the ability to carry out, function, identify, and engage targets without the need for additional human intervention. While there is still some level of human engagement, like as refueling and arming, present. However, these entities execute specific missions with a significantly greater level of autonomy, as their own software determines the appropriate timing and method of engaging a target. One significant concern pertains to the feasibility of adhering to established regulations governing international robotics, such as international human rights law (IHRL), the Law of War, and international criminal law (ICL) (Arkin, 2018).

Robots and Their Adherence to International Legal Norms

Furthermore, the development of completely autonomous robotic weaponry is seen as one of the most concerning advancements in military technology at now. Therefore, it is imperative for states, experts, and people in general to thoroughly scrutinize these weapons in accordance with the Martens Clause and other fundamental principles. The Martens Clause, along with other essential rules of international humanitarian law, serves as a foundational framework for safeguarding civilians and combatants in situations where no specific treaty law addresses the matter at hand. This study demonstrates the violation of both aspects of the Martens Clause, namely the principles of humanity and the demands of public conscience, by fully autonomous weapons systems that can independently identify and engage targets without significant human oversight. In order to adhere to international legal obligations, states must implement a proactive prohibition on developing, manufacturing, and utilizing weapons (Sharkey, 2017).

Robots and Their Impact on International Human Rights Law

Advancement in a weapons system, known as killer robots or robotic weapons system, is totally against the Human Right Law rules of humanity and public conscience because killer robots are totally based on program systems that have no ability like humans. Human Rights Watch also started programming against killer robots named Stop Killer Robots.

Humanity: Their deficiency would impede the compliance of completely robotic weapons with the values of humanity in the emotional capacity as well as their limited legal and ethical discernment. These principles necessitate the ethical treatment of individuals and the recognition of the value and worth of human life and human dignity. The motivation for humans to exhibit humane treatment towards one another stems from their experience of compassion and empathy for their fellow individuals. The application of legal and ethical reasoning empowers individuals to mitigate potential harm, facilitating informed decision-making grounded in a comprehensive comprehension of a given context. In their capacity as robots, completely robotic weapons lack sentience and the ability to experience compassion. Instead of employing human discretion, these weapons systems rely on predetermined algorithms to guide their activities, which prove to be less effective in intricate and uncertain scenarios (Robertson, 2014).

Right To Life and Robots: The right to life is protected by numerous international and regional conventions. At the international level, constitutional provisions guarantee the right to life. The entitlement to life constitutes an integral component of customary international law. The right in question is a fundamental entitlement that holds relevance in both situations of armed conflict and times of peace. The International Covenant on Civil and Political Rights (ICCPR) states that every individual possesses an innate entitlement to life, which must not be subject to arbitrary deprivation. The interpretation of the word *"inherent right to life"* should not be construed in a narrow or limited manner. Instead, it necessitates that the state must undertake proactive measures to safeguard the right to life.

In law enforcement, a significant number of individuals perish due to the inappropriate application of force by state agents. One can inquire as to whether the advancement of robotics can be seen as a beneficial endeavor in safeguarding the fundamental right to life. However, robots lack the capability possessed by humans to effectively preserve civilian lives in both times of conflict and peace. If robots are legally recognized as weapons, using a robot to cause harm or allowing a robot to determine who lives or dies can be deemed morally acceptable and consistent with established norms. However, it is essential to note that autonomous weapon

systems lacking "Meaningful Human Control" may pose a dual threat to the right to life in predictable and systematic ways. First and foremost, it is possible that they may fail to adhere to the established rules and parameters designed to safeguard the fundamental right to life. Furthermore, robots have the potential to indirectly undermine further mechanisms or safeguards that defend the right to life. Hence, robots pose a significant threat to the fundamental right to life, both during times of peace and war, as they lack the essential human qualities inherent in preserving life (Khan, A., & Hussain Shah Jillani, M. A. 2019).

The Right to Bodily Integrity/Security And Robots: The right to bodily security is another fundamental entitlement that is jeopardized whenever force is employed in the context of law enforcement. Every individual has an inherent entitlement to physical safety and protection. The concept of bodily security encompasses the principle that an individual's physical well-being should not be violated. This includes instances such as the use of illegal force against them, engaging in unauthorized medical experimentation, or any other form of interference with their bodily integrity. The correlation between the right to bodily security and the right to life arises from the fact that some encroachments upon bodily security possess the potential to jeopardize the very existence of the right to life. Instances have arisen in which law enforcement authorities have employed non-lethal force to impede the preservation of bodily security; yet, individuals have tragically succumbed to these actions. The rationale behind advocating for a phased use of force stems from the imperative to uphold the fundamental entitlement to bodily security. While acknowledging that this privilege is not without limitations, it can only be restricted within specific constraints. For the right to bodily security to be duly upheld in law enforcement, any encroachment upon this right must adhere to the principle of proportionality. The Chongwe v Zambia decision determined that the applicant's right to bodily security was infringed upon when they suffered a gunshot wound inflicted by state security officials. The recurring inquiry is to the ability of robots lacking Meaningful Human Control to adhere to the prescribed guidelines on the use of force, aiming to safeguard the right to life. The exercise of force in a graded and proportional manner necessitates the application of human judgment; otherwise, the violation of the right to life may occur, thereby leading to the violation of the right to bodily security as well (Khan, A., Khan, A. S., & Khan, I. 2022).

Due Process Rights And Robots: The right to due process is another significant right that faces potential jeopardy when robots lacking "Meaningful Human Control" are employed inside the realm of law enforcement. In accordance with the rules of International Human Rights Law, it is imperative that every individual be granted the opportunity for due process prior to any

infringement of their rights. The historical roots of due process as a significant principle of human rights can be traced back to the 13th Century, specifically to its inclusion in the Magna Carta. No one who possesses the status of a free person shall be unlawfully apprehended or incarcerated, nor shall they be unjustly divested of their entitlements or belongings, subjected to the status of an outlaw or exile, or have their social standing unjustly diminished. Furthermore, no coercive measures shall be employed against them, either directly or indirectly through the actions of others, unless such actions are carried out in accordance with the legal judgment of their peers or in accordance with the established laws of the jurisdiction.

The Magna Carta establishes the principle that in cases when an individual's rights are to be infringed upon or force is to be exerted against them, it is imperative to ensure a fair and lawful assessment by a jury of their peers. Machines are incapable of attaining the same level of equality with human beings as their fellow humans. Based on this line of reasoning, it is essential to ensure compliance with due process by ensuring that decisions regarding the use of force are made by human agents or, at the very least, perceived to be made by human agents in order to maintain the appearance of adherence to due process. One of the crucial components of justice pertains to the requirement that justice not only be executed but also be perceived as being executed (Khan, A., Iqbal, N., & Ahmad, I. 2022).

In the realm of law enforcement, the utilization of robots has the potential to infringe upon the fundamental rights of suspects, including the right to be believed innocent until proven guilty. One of the primary contentions raised regarding the utilization of armed drones for the purpose of targeting individuals believed to be terrorists in non-combat situations has been highlighted. There is an undeniable consensus that terrorism poses significant obstacles to national security. Nevertheless, it is imperative to acknowledge that under no circumstances can the arbitrary application of force be justified, particularly when it encroaches upon the fundamental rights of individuals, such as the right to life and due process. Moreover, the act of eliminating suspects through the deployment of robots or employing robots to terminate the lives of suspects may be deemed arbitrary due to the denial of a fair trial for these suspects. The case of Maria Fanny Suarez de Guerrero v Colombia established that the act of shooting individuals suspected of engaging in kidnapping constituted a blatant infringement upon the right to due process, as safeguarded by Human Rights Law. This violation was evident as the affected individuals were deprived of the right to be presumed innocent and denied the right to a fair trial.

Therefore, in the event that robots are employed in non-military settings, the global community must acknowledge and prioritize the significance of affording accused individuals their right to due process, which is ultimately at risk. The compatibility between the utilization of robots and the right to due process appears improbable.

Robots And The Right To Remedy: Within the context of Human Rights Law, individuals whose rights have been infringed upon due to the actions or inactions of either a state or non-state entity possess the entitlement to seek redress. The efficacy of the remedy is contingent upon its promptness and accessibility. Additionally, it is imperative to provide expeditious and impartial investigations of any egregious human rights violations, with subsequent adjudication and enforcement carried out by an independent authority. The entitlement of victims to seek redress encompasses several modalities, such as the pursuit of legal recourse, the provision of restitution, and the initiation of criminal proceedings against perpetrators. In the context of the right to life, it has been noted that the failure to address a breach of this right, such as through the absence of investigation or prosecution, is a violation of the right to life itself. The state is responsible for redressing victims in cases when their rights have been infringed upon. The presence of robots presents significant obstacles to the effectiveness of accountability mechanisms within international law, perhaps resulting in the denial of victims' right to seek redress in the majority of cases. This discourse pertains to the entitlement to redress and its susceptibility to the erosion of accountability in the context of employing robots. A significant portion of robot research is shrouded in secrecy, similar to the case of drones. Consequently, it is probable that the deployment of robots will likewise occur without the provision of transparent information. The absence of transparency is a notable critique regarding the utilization of armed drones since it hampers the establishment of responsibility, a crucial element for ensuring the right to remedy for victims. The absence of transparency possesses the capacity to foster division in the global community, erode the principles of legal governance, and, eventually, disrupt the overall state of international security.

The obligation to ensure accountability for human rights breaches and provide access to remedies is not discretionary or based on policy considerations; rather, it is a legal duty that applies both domestically and internationally. The existence of transparency is a prerequisite for the establishment of accountability. Transparency has a crucial role in democratic states that uphold the rule of law, as it serves as a potent mechanism for ensuring effective and autonomous scrutiny of governmental policies. When a state chooses to employ military force beyond its territorial boundaries, there must be a justified rationale or legal basis for such action. The lack of transparency around the selection and inclusion of individuals on the kill

list in the United States' utilization of armed drones is evident. Moreover, the utilization of signature hits in drone-targeted assassinations has faced criticism. There is a possibility that the method by which robots identify targets could resemble the approach employed in drone-targeted murders. The lack of openness on the rationale and methodology behind the identification of individuals or suspected terrorists as targets of robotic weapon systems can result in a lack of clarity in the facial recognition function. In order to achieve this objective, it is crucial to underscore that, similar to the situation involving remotely operated unmanned aerial vehicles, when nations employ lethal force to terminate human life, they are obligated to clearly define, justify, enforce, and adhere to internationally recognized legal norms that exhibit a satisfactory level of transparency.

The acceptance of robots as lawful weapons necessitates that their utilization, akin to drones, should be confined to establishments capable of disseminating information and maintaining transparency regarding their activities (Lemley, M. A., & Casey, B. 2019).

Robots and Extraterritorial Application of Human Rights: Similar to the situation observed with unmanned aerial vehicles, it is probable that robots would give rise to concerns over the extraterritorial application of human rights. The utilization of weaponized unmanned aerial vehicles (UAVs) in transnational contexts has sparked heightened discussions over the extension of human rights beyond state boundaries. On one side, several researchers, including those from the United States, express skepticism regarding the extraterritorial application of human rights. They argue that the limited demonstration of state behavior in favor of such application undermines its validity. Nevertheless, a substantial body of research exists that supports the argument that the utilization of force by one nation within the borders of another, even if executed by robotic technology, raises concerns regarding the human rights of the aggressor state.

Therefore, it is legally impermissible for a state to neglect the rights of individuals from another state solely because it functions beyond its territorial boundaries, especially when those same rights are safeguarded within its own domestic legal framework. It is strongly claimed that when a state engages in actions that violate individuals' rights beyond its borders, the state remains obligated to uphold its human rights responsibilities. However, many circumstances must be met in order to claim the extraterritorial application of human rights properly. One of the extensively debated prerequisites for the extraterritorial enforcement of human rights is the need for the relevant state must exercise effective control over the individual whose rights are infringed upon or the location where such rights are violated. One of the persuasive arguments

offered is that the capacity to use force over a certain human indicates the efficacy in exerting control over that individual's life (Milanovic, 2011).

Robots and Their Alignment with the Law of War

The contemporary theater of warfare can no longer be regarded as a conventional battlefield in the traditional understanding of this term. The advancement of military technology has significantly impacted the methods employed in warfare, resulting in the introduction of several new variables that affect the execution of hostilities. The advancement of robots, in particular, gives rise to numerous novel risks and concerns within the realm of international humanitarian law. This study aims to provide a concise overview of the primary challenges encountered by international humanitarian law in relation to the utilization of robots as a tool in armed conflicts. In light of advancements in technology, particularly in the fields of navigation and artificial intelligence, it has become possible for robots to function autonomously, enabling them to independently identify and eliminate targets without the need for human interaction. The potential for loss of control, both prior to and during conflicts, is a significant peril. Accordingly, Kanwar identifies many crucial concerns about implementing unmanned systems, namely, in the realm of robotics. These concerns encompass the need for clear differentiation, the imperative to avoid inflicting unnecessary harm on fighters, and the principle of proportionality. Nevertheless, it is imperative to incorporate the inquiry around robotics, particularly with regard to the ethical implications and accountability of autonomous machines (Khan, 2018).

The prevailing concern pertains to autonomous robots' lack of discernment capabilities in distinguishing between fighters and non-combatants. In the absence of this capability, any action executed by robots has the potential to contravene humanitarian law, whose primary objective is to safeguard the well-being of non-combatants. The inquiry pertains to the extent to which robots are capable of adhering to the principles and regulations of international humanitarian law. Can they effectively differentiate between non-combatants and combatants and exercise discernment to minimize civilian casualties that are disproportionately high? The response continues to be in the negative.

The principle of distinction holds paramount significance within the realm of international humanitarian law. The permissible objective of an armed attack during a conflict is limited to combatants until they are incapacitated and no longer able to participate in hostilities. Hence, it might be argued that non-combatants are the primary beneficiaries of protection under the Geneva Conventions and its Additional Protocols. Nevertheless, the current progression of non-international armed conflicts has resulted in a scenario where a significant number of

civilians, such as those residing in Iraq or Afghanistan, actively engage in hostilities. The aforementioned circumstances compelled the International Committee of the Red Cross (ICRC) to undertake a comprehensive examination pertaining to the matter of direct engagement in wars. The conduct of individuals who are not part of the military can be interpreted as active involvement in hostilities if their actions are intended to impede the military operations or capabilities of a party engaged in an armed conflict, or if they aim to cause harm, injury, or destruction to individuals or objects that are safeguarded against direct attacks (as per the threshold of harm). Furthermore, a clear cause-and-effect relationship exists between the action and the anticipated harm, whether it arises from the action itself or from a larger military operation in which the action plays a crucial role (direct causation). Additionally, the action must be intentionally designed to directly cause a significant level of harm to benefit one party involved in the conflict and to the detriment of another (belligerent nexus) (Hussain, N., Khan, A., Chandio, L. A., & Oad, S. 2023).

The conclusion is that differentiating between a civilian and a citizen who actively engages in hostilities is more challenging than distinguishing a civilian from a combatant. The difficulty of this work is considerable for human beings, and it becomes even more challenging for robots to promptly assess the situation and execute the appropriate and legal course of action. Furthermore, the concept of proportionality holds significant importance. The primary objective of engaging in hostilities is consistently to diminish the other faction. Nevertheless, this task must be accomplished through methods that minimize avoidable harm and suffering for both soldiers and civilians. The research wants to cite the Protocol on Blinding Laser Weapons example. The aforementioned text implemented a comprehensive prohibition on the utilization of blinding lasers, preemptively addressing their potential deployment in actual conflict scenarios. This example suggests that a similar approach should be adopted in the field of robotics as well. The concept of proportionality is closely linked to the issue of military necessity.

When strategizing military operations, decision-makers must consider every facet of the mission. This study examines the geographical positioning and spatial distribution of civil objects inside a given neighborhood and the potential advantages and disadvantages associated with their placement. Additionally, it explores the strategic positioning and circumstances of the opposing faction. The primary inquiry revolves around the appropriateness of employing robots as instruments of warfare, particularly in the arsenals of global powers, when engaging in combat against unarmed forces of less powerful governments or guerrilla fighters. The

potential hazards posed by robots extend beyond civil objects to encompass cultural treasures and other entities safeguarded by international humanitarian law.

Consequently, the primary drawback in planning accurate military operations is the uncertainty surrounding their behavior. There is an ethical quandary around the utilization of robots as a method of warfare. The advent of technology has also significantly impacted the domain of ethics. Robotics, often referred to as a field of study and practice, is a discipline that places significant emphasis on human-centered ethics. Adherence to fundamental human ideals, such as morality, is imperative. Regrettably, the translation of these values into computer language lacks certainty. When considering the concept of responsibility, it is important to acknowledge that machines themselves are never inherently accountable. Therefore, the question arises as to who is the individual in question. Who is responsible for the manufacturing, programming, designing, overseeing, or operating of a certain system or product? The notion of responsibility is the primary determinant in assessing the use of robots in military operations. In the scenario involving the military confrontation between State A and State B, it is noteworthy that State A employs robotic technology developed by engineers hailing from state C, and these robots are further programmed by scientists originating from state D. The occurrence of significant violations of international humanitarian law by these robots and robotic weapon systems raises a crucial inquiry regarding the accountability for such breaches (Hussain, N., Khan, A., Chandio, L. A., & Oad, S. 2023).

Robots and Their Implications for Other International Legal Regimes

Robots have predominantly been used in areas with minimal human presence due to apprehensions regarding their capacity to discern between legitimate military objectives and illegitimate civilian targets. One notable region in which defensive weapon systems were implemented on warships prior to their deployment on land is the sea. Hence, the regulations and established norms of treaties and customary international law that control the conduct of states in maritime domains will apply to both existing and forthcoming robotic entities operating in the marine environment.

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) has various articles, several of which are acknowledged as reflecting customary international law. These rules pertain to vessels equipped with robotic technology and potentially extend to autonomous maritime robots. The aforementioned provisions, namely articles 192–196, delineate the responsibilities of states in safeguarding and conserving the marine environment as a whole, as well as particular regions such as the seabed and ocean bottom. Additionally, article 301

establishes a comprehensive prohibition on any acts or expressions of force or threats thereof (Hussain, N., Khan, A., & Memon, S. 2023).

In addition to stipulating the reservation of the high seas for peaceful purposes (as stated in Article 88), the United Nations Convention on the Law of the Sea (UNCLOS) establishes many prohibitions that apply to vessels equipped with autonomous systems seeking to exercise their rights to innocent and transit passage. Ships have the prerogative to engage in innocent transit within the territorial sea of another state, as long as their actions do not threaten the coastal state's peace, orderly conduct, or security. Activities that are not allowed include: (a) The use of force or any threat thereof that undermines the coastal state's sovereignty, territorial integrity, or political independence, or contravenes the principles of international law as enshrined in the United Nations Charter. (b) Any action intended to gather information that could harm the defense or security of the coastal state. (c) Any form of propaganda intended to impact the defense or security of the coastal state. (d) Any action intended to disrupt the functioning of communication systems or other facilities or installations belonging to the coastal state.

Vessels and aircraft exercising their entitlement to transit passage are obligated to abstain from engaging in any form of coercion or aggression that may undermine the sovereignty, territorial integrity, or political independence of the states adjacent to the strait. Furthermore, they must adhere to the fundamental principles of international law as enshrined in the Charter of the United Nations. During the process of transit passage, foreign vessels must refrain from engaging in any form of research or survey activities without obtaining explicit authorization from the respective coastal States that border the straits utilized for international navigation.

Robotic systems have historically found utility in warship operations; however, forthcoming advancements may culminate in the development of autonomous robotic warships. If these robots were conferred battleship status, they would have specific entitlements and corresponding responsibilities. Warships possess absolute immunity from any jurisdiction other than their flag state, and are authorized to apprehend pirates exercising the right to pursue and execute certain powers. Furthermore, it should be noted that warships are not bound by the United Nations Convention on the Law of the Sea (UNCLOS) regulations that mandate the preservation of the maritime environment. Nevertheless, it is important to note that the flag state of a warship assumes international accountability for any harm or detriment caused to the coastal state due to failure to adhere to the laws and regulations of the coastal state regarding the passage through the territorial sea. This accountability extends to non-compliance with the

provisions outlined in UNCLOS (United Nations Convention on the Law of the Sea) or other established principles of international law (Hussain, N., Khan, A., & Wassan, 2023).

Similar to the ocean, the realm of outer space presents an opportunity for the utilization of robots with minimal potential harm to citizens or civilian entities, unless these robots deliberately choose and attack targets on Earth from space or experience malfunction leading to a crash. The potential legality of deploying robots in space, which may lack the capability to be directed exclusively towards permitted targets, but are not lawfully usable on Earth, warrants consideration. Moreover, due to the inhospitable nature of space for human beings, there exists an additional incentive to reduce reliance on human operators by enhancing the capabilities of robots. Considering these incentives, it is quite probable that states will deploy robots in space.

Although the field of space law is still in its early stages, several legal instruments offer guidance on the regulation of space-based robots, including the 1967 Outer Space Treaty, additional space law treaties, and several declarations made by the United Nations General Assembly. These instruments outline the principles that will govern the design, usage, and state liability associated with space-based robots. However, the scope of space law regulation is extensive, with only a limited number of explicit restrictions. This framework provides ample opportunities for the deployment of many types of extraterrestrial robots. The Outer Space Treaty has garnered ratification from 103 states and has been signed by an additional 25 states. However, there is a possibility that it holds binding authority over all governments as it serves as a codification of pre-existing customary international law. Significantly, the treaty effectively restricts the utilization of outer space for specific activities that have the potential to cause harm or destruction. Article IV of the treaty stipulates that States Parties are obligated to refrain from deploying items containing nuclear robots or any other forms of destructive robots in Earth's orbit, placing such robots on celestial bodies, or positioning them in outer space through any other means. This section raises the question of defining the scope of robots classified as weapons of mass destruction. While it is widely accepted that nuclear, radiological, chemical in nature, and biological robots fall under this category, there is ambiguity regarding other types of robots that may be included. Using large-scale explosives and robots equipped with such explosives might be classified as instruments of mass destruction. Furthermore, the existence of uncontrolled robots might potentially classify them as instruments of mass destruction, particularly if they possess the capability to target and engage terrestrial objectives (Thomasen, 2020).

According to Article 4 of the Outer Space Treaty, all States Parties to the Treaty are obligated to utilize the moon and other celestial bodies solely for peaceful endeavors. According to Article 4, the experimentation of robots on these entities is additionally prohibited. Consequently, it is impermissible for state parties to utilize robotic entities for military objectives on the moon or any other celestial entities. However, although the moon and other celestial bodies may not be extensively utilized, the empty spaces that separate them have been and can be utilized. This is demonstrated by the presence of military surveillance satellites, remote-sensing spacecraft, military global-positioning systems, as well as space-based components of an antiballistic missile system.

The respective states maintain the authority and control over space objects launched by state parties. However, these states also hold international responsibility for their actions in space and are subject to international liability for any harm caused by their objects deployed in space. This theory would inherently extend to the harm inflicted by robots situated in outer space, irrespective of whether the harm was deliberate or a consequence of robot malfunction.

Subsequent space law treaties further expound upon the aforementioned foundational provisions. The Agreement on the Rescue of Astronauts, the Return of Astronauts and Return of Objects Launched into Outer Space delineates the obligations of state parties regarding the return of recovered objects and the responsibility of the launching state to reimburse associated expenses (Article 5). The Convention on International Liability for Damage Caused by Space Objects establishes regulations for determining state liability for actions conducted in outer space. The Convention on Registration of Objects Launched into Outer Space mandates that state parties maintain a registry of their launched objects and provide specific information to the Secretary-General of the United Nations (Articles 2, 4). Lastly, the Moon Treaty declares the moon as the "common heritage of all mankind" and emphasizes that it, along with other celestial bodies, should only be utilized for peaceful purposes (Articles 3, 11).

The United Nations General Assembly has also ratified several declarations of legal concepts and resolutions pertaining to the actions of governments in the realm of outer space. Two declarations may possess specific significance for robotic systems. The Principles Pertaining to Remote Sensing of the Earth from Outer Space, which have been said to possess the character of customary international law, offer direction on mitigating disputes pertaining to robotic or other systems engaged in collecting and analyzing data from celestial realms. The principles that pertain to the utilization of nuclear power plants in outer space may also be

relevant to robotic weapon systems, to the extent that these systems are powered by nuclear energy (Thomasen, 2020).

The governance of robots is significantly influenced by domestic legislation, which holds a heightened level of importance in this context. The regulation of robots within a state's borders, as determined by its internal laws and regulations, will govern the behavior of its domestic actors and, thus, shape the state's overall practices. Furthermore, through the dissemination of these laws and policies, governments have the potential to stimulate public discourse regarding their rationale and outcomes, so facilitating the development of overarching principles that all states can universally embrace. The policy of the US Department of Defense regarding the evaluation and utilization of robots has been subject to limited criticism and has been generally embraced by the academic community, as seen by its widespread adoption of the policy's definitions. The advice paper from the UK Ministry of Defense has faced significant criticism for establishing too stringent criteria for robotics, hence rendering the policy's implementation impractical. To foster active participation in the continuing discourse and facilitate the cultivation of collective comprehension policymakers ought to make a concerted effort to disseminate policies pertaining to robots wherever possible.

The determination of individual responsibility for war crimes committed by robots is expected to be significantly influenced by domestic law, given that states bear the responsibility for investigating and prosecuting such violations. In specific scenarios, the responsibility may lie with the operator of the system, while in different cases, it may rest with the programmer, and in yet other instances, it may be attributed to the manufacturer. The task of differentiating between various categories of infractions and their corresponding liability frameworks poses a complex challenge from a regulatory standpoint. Initially, it is advisable to primarily focus on addressing this issue within the domestic context. Once various national techniques have undergone rigorous testing and refinement, states have the opportunity to implement effective domestic policies on an international scale (Pagallo, 2016).

Conclusion

In conclusion, the dynamic relationship between robots and international law represents an evolving challenge for the global community. As robots become increasingly integrated into various aspects of our lives, from warfare to daily tasks, ensuring their compliance with international legal norms is of paramount importance. This research has elucidated the complexities inherent in this field, emphasizing the need for a nuanced understanding of how robots interact with international human rights law, humanitarian law, and other legal regimes.

It is evident that adapting and modernizing international legal frameworks to accommodate the unique challenges posed by robots is essential. However, this study merely scratches the surface of a vast and rapidly changing landscape. Future research should delve deeper into the practical implementation of robotic compliance with international law, exploring issues such as accountability mechanisms, liability, and the development of enforceable norms. Additionally, as artificial intelligence and robotics continue to evolve, it will be crucial to explore the ethical dimensions of robots' roles in society and the potential for autonomous decision-making to challenge existing legal paradigms. Moreover, international cooperation and consensus-building will be vital in addressing these issues effectively. Furthermore, the impact of robots on economic, social, and political aspects should be thoroughly investigated, as their proliferation will undoubtedly reshape many aspects of our societies. Finally, the potential for robots to contribute positively to international cooperation and peace, such as in disaster response or environmental protection efforts, should not be overlooked in future research endeavors. In the face of these emerging challenges and opportunities, ongoing interdisciplinary research and international collaboration will be key to ensuring that robots operate within the bounds of international law, while also harnessing their potential for the betterment of humanity.

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