

Research Article

Legal Regulation of Military Artificial Intelligence and Autonomous Robots under International Humanitarian Law: Accountability, Compliance, Protection, and Warfare Limits

Safa Abdel-Hai Mohamed Azzam^{1*}

¹Associate Professor, Department of Law, Business Administration College, Prince Sattam bin Abdulaziz University, Al-kharj 11942, Saudi Arabia. Email: s.azam@psau.edu.sa

*Correspondence: s.azam@psau.edu.sa

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Abstract: This paper aimed to study the legal modalities under the IHL that govern the use of AI and militarily autonomous robots in armed conflicts. It involved a descriptive-analytical normative legal approach with an analysis of the conceptual nature of military artificial intelligence, a classification scheme for autonomous weapons, an analysis of the legal status of autonomous weapon systems, and an assessment of the aspects of distinction, proportionality, and meaningful human control of autonomous weapon systems. From a legal perspective, the paper also investigated who is legally responsible if an autonomous system causes illegal damage to others, as well as who is accountable for addressing the social implications of business problems arising from the use of autonomous systems. Current autonomy systems, though, are not yet able to make context-dependent legal and ethical decisions that will be needed in a complex operation in combat. Contextual findings will be necessary to distinguish civilians, wounded or surrendered combatants, or civilian objects. They also pointed to a significant "responsibility gap" with algorithmic autonomy, speed, cybersecurity, and the lack of ability of humans to respond quickly enough. The paper highlighted the potential challenges to the existing legal regime of humanitarian law, particularly regarding how states might use AI in ways that contradict its fundamental principles, and emphasized the need for robust regulation of AI developments and uses, especially to enhance the protection of civilians and to support the current framework of humanitarian law. The study recommended that in the event of a WW2, an international treaty be adopted on meaningful human control of all targeting decisions that would be binding on the world.

Keywords: Distinction; Proportionality; Human control; War crimes; Civilian safety.

1. Introduction

In this technologically advanced era, the control of humans over machines has been replaced by the mutual influence and interaction between humans and machines. This new added capability to machines now encompasses reasoning, learning, perception, decision-making, emotional interpretation, medical diagnosis and management of complex civil and military operations, all of which were once thought to be exclusive to humans. In the military sector, AI is playing a pivotal role in modern defense systems, strategic planning, and combat operations, making it a central part of the defense sector. AI is a key component in the military sector, where its applications in modern defense systems, strategic planning, and combat operations are significant. Implementing AI into arms is said to be a "radical change in arms" and the "3rd age of arms" after the gunpowder and nuclear age, [1].

The current laws of war are under tremendous strain with regard to autonomous weapons. AI systems using algorithms and machine learning challenge the applicability of the 1949 Geneva Conventions and the 1977 Additional Protocols. One of the greatest concerns is the "responsibility gap" that arises when accountability for illegal use of the system is blurry between states, commanders, operators, programmers, manufacturers and private technology companies. As military robots become more autonomous, important questions arise about the ethical limits of machine decision-making on the battlefield, [2].

This is a new test for international humanitarian law (IHL). They were created to govern the behavior of humans during wartime but with the development of systems that operate autonomously there is a question about whether humans can match the speed and complexity that machines can make decisions. [3] states that in the military domain, AI has enhanced the precision of surveillance and targeting capabilities, and in civilian areas where decisions are key and fall outside of legal and military principles, AI has been used to expand its application, [4].

This research investigates how far autonomous military robots and other military technologies developed with AI respect the principles and

norms of IHL. It also examines the legal tools required to allow for meaningful human control, to avoid discriminatory or harmful outcomes, to control such systems, and to hold those responsible for violations of human security and dignity in armed conflicts accountable.

1.1 Research Problem

AI applications in the military domain have also rapidly developed, raising significant legal, ethical, and humanitarian issues such as civilian protection and international peace and security. Although international humanitarian law (IHL) was created to govern the behaviour of people during armed conflict, it is also being applied to the actions of robots and algorithms in the military context. The challenge is also that there is still no specific binding international law regarding the creation or use of military AI.

The rapidly increasing use of AI and robotic systems by military actors adds to the complexity of the issue, with current international laws only covering broad rules of IHL. While applicable to warfare, the application of these principles to autonomous systems is ambiguous, with a need for distinction, proportionality, precaution and humanity. Military robots can be disobedient, unwilling to surrender, dismiss injuries, and not adjust to the constantly varying conditions on the battlefield. Also, in the event of a violation, it is not clear who is responsible, and it could be a state, commander, operator, programmer, designer, manufacturer, or a private technology company.

Accordingly, the central issue of the research can be formulated as follows: What extent of military Robots and weapon systems with artificial intelligence can meet rules and principles of International Humanitarian Law and should there be debated procedures for international criminal responsibility for violations in combat operations related to their use?

The following sub-questions arise in relation to this central problem:

1. What is the current international law regarding the use of AI for armed conflict?
2. What are the limits for compliance of AI and autonomous robots

- under the ethos of distinction and proportionality in IHL?
3. What impacts do robust and smart military systems have on the practice of military business and on the law of means and methods of warfare?
 4. By employing the AI systems of the militaries to commit war crimes or humanitarian crimes, who is held internationally criminally responsible?
 5. How to effectively enforce the International Humanitarian Law while AI is learning and becoming increasingly used for battle?

1.2 Research Significance

This study is relevant because of the increasing application of AI in the design of military weapons. As programming skills advance, machines may become capable of making decisions, and in the future, autonomous intelligence systems could emerge that make decisions without a designated owner or programmer. The situation requires immediate identification of the persons/organizations responsible in order to be able to effectively deter IHL violations.

1.3 Research Objectives

This research seeks to primarily provide a legal framework for future research in this emerging field and, secondly, explore the scope of international obligations for military AI-attributed crimes, map out the legal landscape, and clarify specific mechanisms in relation to the laws regulating military AI systems.

1.4 Research Methodology

Because of the sensitive nature of the content of this study and the many aspects of the legal issue, the researcher decided to use a descriptive-analytical method in the study. A descriptive approach was used in the presentation of pertinent definitions, concepts, legal aspects, and applications of artificial intelligence in the military, in particular of autonomous military robots, to give a clearer explanation of the definitions, concepts, aspects, and real-life scenarios. Analyses of these systems revealed their degree of compliance with international humanitarian law's norms and principles, namely distinction, proportionality and human control. It has also been applied to analyze the international criminal law principles under which violations committed on the basis of AI infringe on international criminal responsibility.

2. The Nature of Military Artificial Intelligence

Military AI is another major change in the world of armed conflict—the third in the realm of weapons following the advent of nuclear weapons—what many consider to be the place of the third revolution. More than a mere technological upgrading of armories, it is a new paradigm of power and conflict. The term "algorithmic warfare," wherein battles are won by speed and accuracy, was coined due to the role of algorithms in architecture defense systems. Consequently, the issue of whether or not machine systems should be allowed to make military decisions and whether or not humans will be in command of the battlefield in the future is still a topic of debate (Petruska, 2024).

2.1 Defining Military Artificial Intelligence and Its Applications

As artificial intelligence (AI) has been extensively researched, it is not yet clearly defined. In linguistics, AI is a computer-driven system that mimics human thinking processes, including understanding, perception, learning, and reasoning, [5]. There are two approaches to legal definitions of AI: one is about AI's ability to mimic human mental processes, and the other is about its ability to autonomously make decisions and solve problems. This study uses the definition of AI from the American National Defense Authorization Act [6] as a system that can act rationally by way of perception, reasoning, learning, communication, decision making, and action, [7].

There are three main types of AI applications: artificial general intelligence, which mimics human reasoning, artificial narrow intelligence, which is developed for a specific purpose, and artificial super intelligence, which could excel human beings in some areas. AI systems can also be categorized into those that don't learn from past experiences (reactive systems) and those that do learn (limited-memory systems) to enhance their performance. One area of autonomous weapons that is of particular interest in the context of AI is the issue of legal and ethical considerations related to human control and the just use of force, [8].

AI has applications across many areas of technology, civilian usage, and military. Technical applications are offered in the field of machine learning and deep learning, and in the civilian sector, they are used for translation and medical diagnosis, administration, and decision-support systems. AI can be applied in the military sector in autonomous robots for mine clearance and medical evacuation, unmanned aerial vehicles (UAVs), for surveillance and reconnaissance, battlefield support systems, and cyber-defense technologies, [9]. These applications demonstrate military AI's applications beyond weapon systems to intelligence gathering, logistics, command support, battlefield awareness and operational decision-making.

Autonomous weapons are tightly coupled to military applications of AI, where the weapon is not autonomous, but rather, autonomy is engineered by algorithms. The United Nations (UN) states that autonomous weapon systems once activated can identify and attack targets without any more human intervention, while the International Committee of the Red Cross (ICRC) notes that they can adapt to change. The systems are, therefore, seen as a weapon that can independently pick targets and engage them, in the present shapes and in the future in different ones with greater autonomy. There are, however, some international discussions that differentiate between systems which still have some limited human control over them, [10].

Most of the time, autonomous weapons are based on an AI program capable of autonomously making decisions for defense or attack without the constant supervision of humans. Military AI is a specialized subset of AI that is used in the military and for combat operations, such as battlefield prediction, decision support, target recognition, surveillance, processing of intelligence, and logistics. The Stockholm International Peace Research Institute says that military AI allows machines to learn from data, gain knowledge about its surroundings and pursue military goals. AI is thus no longer just an analytical tool, but a crucial aspect of today's combat systems, [11].

There is no universal definition for autonomous military robots, but most definitions focus on autonomous decision making, mobility, programmability, and autonomy. Military robots are often referred to as reprogrammable multifunctional systems or self-controlled weapon platforms moving on land, sea or air with varying levels of autonomy depending on mission. They are described by international bodies like the ICRC and the UN Human Rights Council as "automated weapons systems which can select and engage targets without further human intervention. Unlike the USA, which emphasizes the decision-making process for lethal force, the United Kingdom places greater emphasis on the process of analyzing the environment and monitoring humans along with the larger chain of command and control, [12].

Military AI and military robots should therefore be distinguished, as the former is a necessity, whereas the latter is not. Military artificial intelligence is the cognitive, algorithmic, and programmatic aspect of AI that is used for perception, analysis, prediction, learning, and decision-making. Military robotics is the physical or kinetic platform that allows for field decision-making. For this reason, the role of AI is to act as the robotic system's cognitive component, while the robot acts on the operation following the decision. Artificial intelligence can be used on its own without a robotic platform, as in the processing of intelligence data, observing satellite imagery, or within military control centers to assist in command decisions. Therefore, military AI is generally the bigger picture, which includes the algorithms, software, and decision-making systems, while military robots are one of the physical means for implementing military AI on the battlefield.

2.2 The Importance and Characteristics of Military Robots

Preparations have been made to use AI and robotics as viable alternatives to human soldiers in combat, primarily to reduce hazards for the soldiers while on the battlefield and to save on soldiers' training, provisioning, and logistics. Advanced technological states have also started to create combat units that involve human and robotic units to enable the robots to conduct direct combat missions while the human component is to take ethical and strategic decisions at a higher level [13].

High-risk operations are typically carried out using military robots and autonomous systems that would put soldiers' lives at risk. AI can analyse vast amounts of data more quickly than humans and make better decisions in military operations, which can enhance the efficiency of military operations. AI can analyse large data sets at a much faster pace than human beings and make better decisions in the context of military operations, which can improve the efficiency of military operations. Unmanned aircraft (UAVs), unmanned ground vehicles (UGVs), autonomous submarines and humanoid robots are used for reconnaissance, surveillance, logistics, combat support, search and rescue, mine detection, and explosive disposal. UAVs collect intelligence about enemy positions and the battlefield conditions, and UGVs are

tasked with delivering supplies, ammunition and equipment, [14].

The use of military robots has several strategic benefits such as speed, accuracy, endurance and working in dangerous environments along with coordinating with human command systems. They can analyze information in seconds and this ability underpins "hyper-speed warfare" particularly in regards to unexpected threats, like hypersonic missiles or cyber-attacks. They are further enhanced by advanced technologies like night vision, thermal sensing, adaptive systems and self-sensing, but performance is still subject to the design of the system, and the efficiency of its energy use, [15].

These also have a number of special features: mission autonomy, reliance on sensors and GPS satellites, civilian / military applications, and swarm intelligence. The swarm systems transmits real time data, coordinates action and launches simultaneous attacks without being controlled by humans and it could be hard to control it with the traditional defense system. The impartial granting of authority for autonomous systems to choose and strike targets, however, poses significant international humanitarian law (IHL) issues, such as the principle of distinction and the principle of proportionality, [16].

3. The Legal Foundations of Military Artificial Intelligence and Military Robots

Military robot UAVs have emerged as a significant point of competition among the leading world powers, serving as a crucial means for them to establish their presence on the global stage. Military-to-civilian human interaction has already occurred in international armed conflicts, where military robots and autonomous weapons have been utilized, prompting the ICRC to urge lawyers to conduct comprehensive legal analyses of these new autonomous weapons to ensure compliance with IHL, [17]. It raises crucial questions regarding their legality, classification, and ability to adhere to the rules of armed conflict, such as the ability to differentiate between combatants and civilians, determine who is wounded, detained, or disheartened, and ascertain whether they meet the standards of distinction and proportionality.

3.1 The Legal Nature and Classification of Military AI and Military Robots

The legal status of military AI systems and their application of the rules of war is an important area that needs to be addressed to ascertain the legal rules that apply. The transition to remotely controlled systems to autonomous technologies poses questions to legal classifications, such as whether the systems are simply battlefield weaponry or autonomous technologies that can make battlefield decisions without human supervision. There is no agreement internationally on giving military robots legal personality. One view holds that robots have a moral or legal personality due to their ability to think. This however is questioned due to the fact that legal persons typically act on the basis of human responsibility while autonomous robots could function without direct human intervention.

Another theory suggests an "electronic personality", primarily in the context of responsibility and damages for autonomous systems. Some scholars liken robots to corporations that can be held civilly liable for harm that they cause while operating. However, this is an incomplete strategy, as it does not take into account criminal responsibility for grave crimes committed in armed conflict, and it does not adequately account for compensation. A third method is to view robots as a virtual part of the world that needs to be supervised and protected by humans. This view embraces their cleverness and takes from them the autonomy of the law. But critics say that isn't an accurate reflection of the capabilities of today's AI systems, including those using deep learning. Thus, the most viable option is to keep military robots as sophisticated forms of combat equipment controlled and responsible to humans, [18].

Definitions of military robots also are in dispute. Some scholars consider highly autonomous robot's non-conventional weapons due to their capability to harm civilians if they are not identifiable as combatants. Others deem them conventional weapons; autonomy is still tied to 'humans,' and weapons of mass destruction are defined in international instruments.

The level of independence and the severity of the effects caused should be used to balance classification. A robot armed with lethal or indiscriminate effects that is also very autonomous could be considered a nonconventional weapon. On the other hand, robots that are controlled by humans and that have limited impact could be considered conventional weapons.

There is ongoing discussion about the ability of military AI and robots to abide by IHL. Another view is that with the development of technology that allows consistent legal execution, autonomous weapons

can be programmed to meet humanitarian principles, [19]. But the ICRC must stress that controlling such weapons human control must be the key element.

In the absence of any specific treaty rule, the Martens Clause is an important safeguard. It brings new weapons in line with "humaneness" and the "sacred laws of public conscience" [20]. Although there is no explicit ban, autonomous weapons do not automatically qualify as lawful weapons.

There is also concern about autonomous weapons pursuant to Additional Protocol (AP) I (1977), Article 35(2) of the protocol, which states that superfluous injury or unnecessary suffering is forbidden. Article 36 also obliges states to consider any new weapon, means of achieving warfare objectives, and methods of conducting warfare prior to their adoption. Thus, IHL principles should apply to autonomous weapons in all cases.

It is not yet possible to effectively identify civilians or targets by distinguishing a military objective from a civilian object and it is not reliably possible to distinguish between a combatant and a civilian with autonomous weapons. Articles 50, 51, and 52 have been dedicated to civilians and civilian objects, while Article 48 has been dedicated to such distinction at all times. Arms that do not make such distinctions risk being considered illegal by IHL, [21].

Civilians are not allowed to be used as human shields, and individuals out of combat must be shielded. Autonomous weapons that do not have human judgment could be more likely to kill civilians, wounded people, and surrendering combatants due to failure to adequately consider contextual legal circumstances, [3]. In the absence of exception, there is no justification to use weapons that are unable to distinguish between civilian and military targets, the ICJ has added.

The problems humans face with autonomous weapons aren't linked to the technology itself—it's the lack of meaningful human control that poses the issue. IHL was made for human decision makers who can make conscious and contextual judgments. It is still a challenging matter, though, when autonomous military robots cannot lawfully meet distinction and proportionality, which includes populated regions.

3.2 Military Robots and the Principles of Distinction and Proportionality

3.2.1 The Principle of Distinction

A key principle of IHL is the 'principle of distinction,' which mandates that in an armed conflict the hostilities must be directed primarily against military targets but not carried out indiscriminately. The principle of distinction is one of the key principles of IHL that requires an action taken in an armed conflict to be directed primarily against military objectives, but not to be undertaken indiscriminately by those taking the action. This principle has been long recognized in law, particularly where the state views war as a state-to-state rather than a people-to-people relationship. This principle has been acknowledged as an integral principle of international humanitarian law, which saw the protection of non-combatants as one of the most important duties. The principle was later consolidated in the four Geneva Conventions of 1949 and Additional Protocols I and II of the conventions.

Preserving human life is and has been the heart of distinction. Therefore, civilians may not be killed pursuant to Common Article 3 of the four Geneva Conventions, as applicable to the First, Second, Third and Fourth Geneva Conventions, Article 75(2) of Additional Protocol I and Article 4(2) and 13(2) of Additional Protocol II. Under the principle, also, "all practicable precautions" must be taken to prevent damage to civilians and civilian objects. In choosing the location of military objectives, the attacking party is forbidden from locating civilian areas near those intended for military action because, so long as practicable, civilians should be placed as far apart from military objectives as possible. In selecting the sites of military objectives, the party in conflict with the number under attack is forbidden to be near civilian areas, except where such an arrangement is impracticable, when civilians in this party must be distanced from those to be attacked as much as practicable from those to be attacked, [19].

The exception in AP I, Article 51(3), extends protection to civilians unless and until they "take a direct part in hostilities." Therefore, direct attacks on civilians are forbidden and the loss of protection cannot apply before or after the period of direct participation. The ICRC has deemed such participation as acts occurring within an armed conflict between the parties to the conflict. In some situations, autonomous systems may exhibit high levels of analytical ability. The key question under IHL from a decision-maker angle, however, is not whether the person or machine is human or not but whether the IHL principle of differentiation is used appropriately, [22]. Theoretically, autonomous arms can be linked with sophisticated cameras to identify people or differences between civilians

and combatants. They can also be trained to identify protected situations (surrender, injury, medical condition, and protected object). If they are unable to perform these activities reliably, they can be regarded as indiscriminate weapons.

While artificial intelligence and robotics are being developed, there has still been no scientific consensus as to whether machines are able to meet the legal requirements of distinction. It goes beyond achieving high accuracy in the sensor to what happens in the conversion from humanitarian rules to computer code. That is not only about the accuracy of the sensor but also about what will happen when humanitarian rules are translated into computer code. Unlike humans, autonomous weapons should be capable of separating out the combatants from the civilians and from the medical staff and from the relief workers and from the Red Cross and from surrendering fighters and from wounded or injured persons. Also, it is not known how such systems can identify an intention to surrender or implement possible precautions during an attack. They may also change their behavior in other ways that can deceive the machine assessment.

The Martens Clause provides that the use of force should be subject to human control. Human response is enough of a basis to require human judgment in having lethal operations. Accordingly, autonomous weapons, which cannot, with sufficient reliability, determine a protected person and/or a protected object and which cannot, with sufficient reliability, respond to surrender principles and to injury or respond to changing situations on the battlefield, are, at this point, not to be considered fully compatible with International Humanitarian Law.

3.2.2 The Principle of Proportionality

The concept of 'proportionality' under Additional Protocol I, Article 51(5) of the Geneva Conventions is any act of violence that is likely to cause disproportionate damage to civilians in relation to the military advantage gained. It relates to the legality of military actions and holds that in a conflict any harm done must not be greater than the tangible and direct military benefit. There remains the question of if/when military AI can stay true to this rule. That commanders shall take reasonable precautions to avoid attacks likely to cause civilian death, injury, or damage to civilian objects or a combination of these that are not proportionate to the likely military advantage, [23].

AI-driven combat systems have raised legal issues due to the need for complex contextual considerations, which may not be fully captured by the algorithms. Failure to respond to dynamic conditions in the field during active conflict operations could see AI cause tens more innocents to be more vulnerable to disproportionate responses and attacks, according to an ICRC report, [24]. It has also been observed that it is difficult to translate proportionality into computer code. While a robot can gather data that are required to determine the risks of civilians, the benefit that the military expects from the robot is constantly evolving as a function of the plans of the commanders and the situation on the battlefield. Apart from the minimal civilian damage, which is clearly discernible, autonomous weapons cannot assess proportionality unless military operations and plans are always updated. This is one of the best IHL promises against the deployment of fully autonomous weapons in the long term.

In regard to 'feasible precautions,' IHL says nothing more than 'feasible precautions for states who deploy human soldiers.' Yet, the limitations in operating military robots do not excuse potentially being inactive on a compliance requirement by IHL standards. The most relevant humanitarian aspect of autonomous force decisions revealed in specialized studies is the extent to which there is a balance between achieved military gain and possible collateral effects. No human intervention will be able to make a loss-of-life decision that would comply with IHL. Safeguarding the human condition and making decisions ought to remain in human hands, rather than technological ones, and hence operable through innovation.

A means to evaluate military robots' effectiveness in performing attacks should be developed to compare with the effectiveness of human-operated robots. Whether it is feasible to take precautions will have to be judged according to what humans who operate the machine can do. Autonomous weapons also need to have a sensor system and modification capability, and they need to be continually updated with military plans to see if a clear military advantage will be gained and if civil risks are greater than the expected military benefit.

Both quantitative and qualitative tests must be used to determine proportionality. The quantitative test looks at how the response relates to the scale of the attack, the weapon, and the amount of damage inflicted. The qualitative test focuses on the suitability of the means used to the objective sought. Proportionality thus involves weighing humanitarian considerations against military necessity [25]. takes the view that it is a customary agreement that applies to everyone in a conflict.

Intelligent weapons are unable yet to abide by proportionality in the

proper way, in their precision part. Supporters say bombs like this could help to cut civilian deaths as they target military, not civilian, targets. But people don't think that complicated ethics can be done with technology, whether they're an associate in uniform or known civilians in a military facility. There are also concerns critics raised about the feasibility of programming a weapon to think and make decisions for something like soldiers and how one can claim it's rightfully decided when in fact it is. That concern is well-founded because there is empirical evidence of hundreds of civilian casualties that have been incurred due to sensor-assisted targeting that has been done by drone operations without human oversight. The focus point is the demonization of weapons and the use of force losing their human control. Penetration attacks can also contaminate programming databases and result in extreme electronic failure, [26]. Whereas the Chinese K-12 operators are responsible for such consequences if they don't take adequate cybersecurity measures.

In accordance with the third guiding principle on lethal autonomous weapons, interactions between humans and machines at various stages of a weapon's life cycle shall ensure compliance with applicable international law, including in particular IHL. The nature of such interaction should vary in quality and quantity according to the operational context and the overall system capabilities and configuration of the weapon system, [27]. Consequently, it is the responsibility of states to ensure compliance of their weapons with other IHL principles such as proportionality and distinction. If this is not done with weapons based on these principles, it would mean the international responsibility of the states that developed the AI programs in their creation.

The battlefield may feature both "human attachments" and IHL-defined military robots. The battlefield can have military robots (as defined under IHL) and "human attachments" (under Article 1 to Annex I of the four Geneva Conventions on distinctive markings). Additional signals or systems to enhance identification through technological development may be accepted as part of the data under that article from the high contracting parties, provided that they agree. The measures outlined under Article 9(1) also pertain to electronic identification for the use of second-generation surveillance radar. These measures may also be adapted to find military robots on the battlefield. State armed forces robots used in this respect should also be provided with adequate identification that adheres to Article 17 of the Geneva Convention Relative to the Treatment of Prisoners of War.

Presenting these arguments, there are significant concerns about the current use of autonomous robots and their lack of consistency in distinguishing and proportionality in the lack of meaningful human control. The ICJ has confirmed that the fundamental rules of IHL are part of customary international law; thus, means of action and weapons that are in violation of these principles, in their turn, are illegal, and any negotiation aimed at allowing violation of these rules annuls itself.

4. International Criminal Responsibility for Military Artificial Intelligence in Combat Operations

With the increasing prevalence of AI in military operations, there have been AI-related complaints regarding the potential benefits of AI in combat and the potential for violations of IHL. These complaints have raised concerns regarding the compliance of technologies with IHL and the extent to which current international responsibility regulations can address the attribution of liability for AI-tortious crimes to the designer, manufacturer, commander, or state [28]. As regards armed conflict, the use of intelligent systems can lead to the commission of war crimes and severe violations of international law, where the use of such systems is not in compliance with international law.

4.1 State Responsibility for the Use of Artificial Intelligence in War Crimes

As regards modern technology in the course of armed conflict, the parties of The Hague Convention of 1907 and the Geneva Conventions of 1949 and Additional Protocols have decided that states shall only permit armed forces to use such technology if it is an exercise of their responsibility. The best way to control the state application of AI technology in weapons development is the end of an international treaty on state liability for damages due to autonomous weapons. Determining a natural person's responsibility for a decision made by these weapons plays an important role in assigning responsibility to the state.

When a robot kills a human being, to whom the international law says it is not permissible to target, who will be held responsible? Programmer that created the program? Who gave permission for the use of this robot? The military who are monitoring its usage? Who else was able to stop the robot? What is done when things go wrong? What does

the team do when things go wrong? Are the engineers responsible who finish the robot? Is there a case where a civilian's life is terminated as a result of the actions of an autonomous robot that could be considered no different than a death caused by a bullet?

The UN Group of Governmental Experts on Lethal Autonomous Weapons has set a framework for human responsibility over choices made by robots that kill people, reinforcing the assertion that humans are ultimately responsible for such choices—and that a robot could not take the blame. The group has also confirmed that the responsibility for AI program developers, commanders, and operators of these weapons falls on them as well.

The state's responsibility, according to general rules of international law, is to be responsible if the proposed omission or positive or negative action of its own to another state causes harm or damage. International responsibility was closely linked with the internationally wrongful act, but in some instances international law has developed the idea of state responsibility even in the absence of an internationally wrongful act: "The notion of 'potential risks' has been taken up by international law in certain cases." The risk of using AI to create weapons is the best possible starting point for legal responsibilities for autonomous weapons decisions made by states. States that assert greater compliance with international laws are those that can say that they are responsible for the development, deployment, or use of such weapons in cases where harm results for another state.

However, a treaty on the international responsibility for damages resulting from autonomous weapons would be of major importance in the current stage, as autonomous weapons are not going away, and the issue of responsibility and accountability would be crucial. The best future answer to potential damages should be to build a mechanism of state responsibility for decisions regarding the development, deployment, and use of these types of weapons in which states are obligated to compensate for damages caused by such weaponry.

4.1.1 Responsibility of States that Develop, Deploy, or Use Autonomous Weapons

The Fourth Guiding Principle on lethal autonomous weapons states that responsibility for the development, deployment, and use of any new weapon system covered by this Convention on Certain Conventional Weapons must be ensured "in accord with applicable international law," which requires that weapon systems operate within a responsible chain of human command and control. The state's responsibility for autonomous weapons might then be shared in three aspects: design, deployment, and usability.

State responsibility for development. Fears have been raised over how capable high-tech AI systems are of allowing weapons and armed robots to perform a big job with little operator supervision. These types of programs can allow weapons or robots to make decisions for themselves that were not specifically programmed, either because of a change in the environment or a training/simulation program. AI also allows for cases where multiple alternatives exist and it enables machines to choose which of them to adhere to; this means that the machine, instead of the programmer, is the decision-maker. Thus, it is virtually impossible to predict future risks. An autonomous weapon would make a decision that would cause harm; the international responsibility would be on the state that developed the AI program used to make the decision in the weapon's manufacture. States establishing such programs should guarantee that they do not result in a weapon being added 'in the grey area' between human and computer intervention. State responsibility for deployment. In accordance with the Fourth Guiding Principle, those deploying any weapon system during an armed conflict, including those who participate in the chain of command for the deployment of such systems, need to be held accountable for their actions under the applicable international law. This principle also establishes an international obligation for states to provide reparations for any injuries caused by the use of autonomous weapons, specifically the duty to compensate for unlawful damage when required. Military commanders, meanwhile, can be held liable for committing individual international humanitarian law offenses in cases where they permit or authorize the use of weapons in situations resulting in such violations. State responsibility for deployment might not implicitly stem from responsibility for development, as developing AI ammunition is sometimes permitted under international law, and potentially, some autonomous systems might be lawful when used within strict legal bounds. Thus, the decision to implement a new weapon must be made taking into account its technical specifications and the IT&M aspects of deployment. If one state builds the weapon and another uses it in an unauthorized manner, there could be joint responsibility. Considering these factors, any proposed treaty should include an element of "joint and several liabilities," enabling the injured party to go to the deploying

state or to the developing state, depending on what is found to be the determining cause of the injury, [29].

Joint liability could be agreed on between the states that are developing the resources and the states that are using them in order to give greater protection to victims' rights. It would render it impossible for states to avoid liability for reparations under commercial contracts or technical defects or by programming error or inability to foresee malfunction. It would also make it a legal obligation of "extraordinary diligence" to design and test the weapons and to export, deploy, and use them once they have been put into service, which is effective when the autonomous systems are deployed. It would also turn the creation and testing of intelligent weapons into a legal obligation to exercise "extraordinary diligence" throughout their life cycle, from the design of the weapon to its testing to its export, deployment, and operational use when it reaches the stage of deployment; that is the moment the autonomous system is brought into operation. State responsibility for operation.

In compliance with international law, AI-manufactured weapons may comply with international law if their operating programs include an effective human operator in the decision-making loop. In cases where this situation arises, the state that developed, reviewed, and used the system, along with the commander who authorized its use, would typically not be held responsible for the system, provided that the device was properly designed, reviewed, and used in accordance with the law. But if this operator does not operate the weapon correctly and such an error leads to losses of life or injuries, international responsibility would manifest in the duty of the state from which he/she hails. The direct oversight of human rights is thus a basic protection against violations of IHL. All operators should be vigilant to anticipate potential threats and be able to understand both the technical characteristics and limits of operation and the possible consequences of using the weaponry with which they are entrusted. However, in practice, there are significant problems to overcome, especially for autonomous systems that can make targeting decisions quickly, which may prevent the operator from intervening or overriding the automated decision in real time. In this context, the possibility that the human operator could be "present" in the loop for making decisions, but actually not able to help the machine, is an issue to be addressed such that the human might also feel that they are part of the decision-making loop but in reality they are not since they are unable to effectively respond. Thus in many operational scenarios, the human operator might be, on the formal scene, 'present' inside the decision-making loop but effectively incapable of making any meaningful contribution. Furthermore, States sometimes employ robotic systems, and the allocation of operators to individual robots is not always in line with the logic needed to sustain military systems.

4.1.2 State Responsibility for Risk Assessment and Cybersecurity

All states should insist competent institutions evaluate the risks of using AI in weapons from design and development and testing through acquisition and deployment and when in use. The primary problem seems to be that there is no unanimous, internationally accepted terminology for 'risk'—some states view risk in a very restricted sense and see only the threat to their own armed forces and not the threat to other armed forces, civilians, civilian objects, or other states. The state's responsibilities in the area of risk assessment should thus not be limited to the internal security of the country and should also encompass all potential humanitarian and international risks. In any proposed autonomous arms treaty, it should make clear exactly what risk is covered, as well as correlate this risk to internationally recognized types of harm, such as unlawful civilian casualties, indiscriminate effects, cyber manipulation, and violations of international humanitarian law. Meanwhile, enforcing a zero-risk requirement for autonomous weapons is impossible; a sensible legal rule would require their battlefield capabilities to match the error margin of trained human combatants in the same conditions.

Another worrying situation is the potential empowerment of what could be termed "autonomous weapons"—driven by terrorist groups or unauthorized non-state actors—which, of course, would be a serious threat to international peace and security. But even if these weapons aren't stolen, their software, algorithms, and manufacturing programs could be hacked or stolen. This makes the sixth Guiding Principle on autonomous weapons about the security of such weapons and programs and their protection from theft, unauthorized access, and cyberattacks. Accordingly, the use of automated systems and the reliance on the duty to take reasonable measures to ensure adherence to IHL should not shift international responsibility to the state of origin in cases where violations occur due to "inadequate risk assessment," "inadequate cybersecurity measures," "defective supervision," or "failure to prevent foreseeable misuse." This responsibility will create or lend validation for the military and international control of autonomous weapons and Western

technologies.

4.2 Individual International Criminal Responsibility for Crimes of Autonomous Robots and Weapons

According to Rome Statute Article 25, the ICC can exercise jurisdiction over those who were directly involved in committing international crimes, including military and political leaders who have "direct or effective responsibility" for unlawful attacks using AI technology. There is a problem, however, with criminal law, because it requires criminal intent. Proof is much more difficult in the era of so-called intelligent systems, as these are not equipped with a will or legal awareness like humans, [30]. The criminal law is presented with a huge challenge to prove with autonomy and AI systems the involvement of the commander and algorithm designers in war crimes. The developers might argue that their systems are autonomous and do not require human interaction when making decisions, thereby making it difficult to attribute a criminal belonging to their system.

Today, due to the rapid development of technology, big tech giants are major players in the development of military systems using artificial intelligence. International law imposes responsibility on states for the actions of their armed forces, but private companies that develop and design combat software are not explicitly under legal control. While individual criminal accountability for war crimes is allowed in accordance with the Rome Statute, there is an urgent need for a mechanism for holding private companies liable for war crimes arising from their development of military technologies, which contribute to grave breaches of IHL. There is a significant gap in the legal framework regarding accountability for NGO involvement in serious violations of IHL related to the development and use of intelligent systems, and this issue must be urgently addressed by strengthening international criminal law.

The leverage of autonomous weapons has been the subject of hot debates in academic circles and research related to individual responsibility for crimes committed with these. There are two options now: One is claiming the international criminal responsibility of the military commander, not the designer or manufacturer, and the other is attributing international responsibility for crimes caused by such weapons to the purchasing state.

4.2.1 Individual Criminal Responsibility of the Military Commander

Individual responsibility defenders of military commanders have always acted as the foundation of IHL, which is the four Geneva Conventions and additional protocols. According to Article 57 of Additional Protocol I, commanders are required to take all 'feasible precautions' when planning specific organized attacks, while Article 87 mandates that they must 'take all measures' they deem 'necessary to prevent further violations' after grave violations occur, and it specifies that such 'grave' violations must be 'suppressed.'

Commanders' responsibility is not unlimited and military orders must be issued in an organized international context, in light of IHL rules and principles. Those commanders who go beyond this are liable to international responsibility for commitments to war crimes. Answering this question is supported by Rome Statute article 28, laying out the mental elements that constitute command responsibility: that the military commander "knew or, given the circumstances, should have known" that forces under his command were or were not to be committing such crimes and "failed" to take "all necessary and reasonable measures within his power" to prevent or to repress their commission or to refer the issue to competent authorities, [31].

Then, the commander is responsible for actions by human subordinates and hence for a robotic subordinate that can be autonomous. But, then, the commander's criminal liability for subordinates' conduct only extends to when he/she was aware or should have been aware of the subordinates' intent to commit a crime. This makes answering the question more complicated, as it's hard to know if the commander has enough expertise about weapons programs to determine how he would react to them. Of course, this isn't an easy thing to do, but the commander needs to have enough knowledge about weapon characteristics and its capacities. Any commanders who are unaware of weapon technology in the field of AI do not relieve themselves of responsibility if AI weaponry inflicts human casualties in accordance with the IHL. The commander who decides to increasingly use these weapons must be knowledgeable enough about their capabilities and confirm that they are in line with IHL.

4.2.2 Individual Criminal Responsibility of the Soldier

Article 33 of the Rome Statute deals with the issue of criminal liability for actions taken in the execution of a government or military

order. If there is a legal obligation to obey, the person is not deemed to be under a superior command if the order is not manifestly unlawful or he does not know the order is unlawful; then the criminal responsibility does not protect a subject from the duty to follow the superior order. It is recognized that orders to commit genocide are 'manifestly unlawful,' and orders to commit crimes against humanity are 'manifestly unlawful.' A balance of international justice and obligations upon a soldier is possible according to Article 33.

Opinion has split on whether or not autonomous weapons should come with a leader. Others contend that responsibility should lie with the commander, not the robot, as robots do not need human participation in the execution. Still others believe that command responsibility would be a violation of personal punishment, as the robots have full autonomy when deployed without any human involvement in the activities they are supposed to carry out. These weapons do not act as per the instructions given to the Commanders and they can't foresee what damage may be caused or even prevent such weapons from being activated.

This author does not agree: If there are any errors, the user is responsible legally for abusing such arms! Since the robot is nothing more than a machine that cannot tell right from wrong, operation procedures must be known by the user. Robots could also be misused or engineered to create violations, shifting the blame to the commander who allowed them to be used or one could be made to run without appropriate protection. It would be hard to imagine autonomous weapons functioning on their own without orders from the commander to activate them. Weapons that can work without orders and, where applicable, without guidance, but for which the responsibility lies with the individual who activated them. It is important to make clear to commanders the rules on the use of the robots stipulated in Article 36 of Additional Protocol I, but not the nuances of programming. Civil penalties as punishment to the commander are problematic as they could not be enough to deter him.

4.2.3 Criminal Responsibility of the Designer, Programmer, and Manufacturer

Where autonomous weapons are used to commit a crime, if commander responsibility is required, an alternative focus puts liability on the programmer and manufacturer because their task in programming and the design of the weapon makes them responsible for it, particularly when it is used in breach of IHL at the time of the mission. Those who believe designing and manufacturing systems are not the only significant operators must also be careful about the programming and design of autonomous weapons, ensuring they fully respect IHL rules and principles before they are sold. Such an approach minimizes the danger of crimes arising from programming and design likely to be inconsistent and/or hostile with the requirement of IHL. The aim is to prevent future armed conflict emergencies involving IHL violations in the use of future technologies.

In the manufacture of robots, many people and experts are involved; it would be impractical and unreasonable to rightly pinpoint a single individual as solely responsible. National legislation is therefore proposed to establish and fairly apportion penalties to ensure that no one escapes accountability. A successful prosecution under the international criminal justice system ultimately failed to hold the commanders and programmers accountable for the machine's failure due to the principle of autonomy. The notion of transforming criminal intent to include gross negligence or risk-taking by the offender, as is done with weapons, must be applied to robot crimes, or else a "technological immunity" will be created and allow for war criminals to escape liability.

5. Conclusion

The introduction of new challenges to international law is one of the numerous ways in which the development of military AI is addressing the use of autonomous military machines and their role in armed conflicts. These systems analyze data, detect and identify targets, and assist or make combat decisions without necessitating a significant amount of human involvement due to a limited degree of automation. Therefore, they have significant reservations regarding their capacity to adhere to the principles of proportionality, humanity, precaution, and distinction. Therefore, this study indicates that artificial intelligence in the context of the military is not only a technological development; it is a legal and humanitarian matter that impacts the civilian realm in terms of how these issues of protection, accountability, and international peace will be dealt with.

Some military AI uses are still inconsistent with IHL, but using algorithms that don't need to be directly responsible for the attack is even more problematic. It is important to maintain a clear distinction between

artificial intelligence, which is cognitive and analytical, and the robotic systems used in the field that function as weapon systems executing decisions. This is an understanding that makes it difficult to determine responsibility in cases of harmful incidents that are not lawful. More and more autonomous combat system development by private firms compound this issue even more, especially if there is no effective international monitoring.

The independent action of military robots also leaves a big responsibility vacuum. Proof of direct criminal intent is more difficult when an algorithmic process, its adaptive learning, technical fault, or speed of operation brings about an unlawful outcome. This does not exempt states, commanders, operators, programmers, or manufacturers from responsibility. The treaty's lack of an explicit prohibition on autonomous weapons does not automatically license their use, as autonomous weapons now fall under the treaty's rubric of humanity and public conscience.

In conclusion, regulations to control military AI are currently inadequate. International law should be established, enforced, and used in this context so that parties can be held accountable for the use of autonomous weapons that infringe upon human dignity and international security.

Recommendations

The paper suggests forming a concrete international contract that would ensure the development, testing, transfer, and use of military AI and autonomous weapons systems globally. This will in effect send all vital attack jobs to the Colts—such as selecting and engaging targets—and provide the adopter a level of redundancy in control that would be beneficial to him. Also, it should inhibit systems that are completely out of human control. States must also assess the law before giving it their operational blessing to make sure that it fulfils the notion of proportionality, of distinguishing between military and civilian use, of acting in an informed manner, and of acting in a manner that is fair to human beings. States, commanders, operators, designers, programmers, manufacturers, and private companies should establish clear accountability rules, ensuring that none of them can shift the blame for illegal consequences onto the algorithm or technical fault. Furthermore, it is essential to establish policies and procedures for military deployments and enhance the security of the military's cyber systems. Furthermore, deployment should be limited to regions with legal uncertainty or civilian dominance, and humanitarian law requirements should be incorporated into the deployment systems. These are measures that would eradicate the "responsibility gap," enhance protection during peacetime, and delegate the development of new technologies for killing to human judgement, legal accountability, and public conscience.

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References

- [1]. Anyebe PA. Autonomous weapon systems and command responsibility under international humanitarian law. *Journal of International Law and Jurisprudence*. 2023;14(1):91-109. <https://journals.unijos.edu.ng/index.php/ijl/article/view/118>
- [2]. Amoroso D, Tamburrini G. Autonomous Weapons Systems and Meaningful Human Control: Ethical and Legal Issues. *Current Robotics Reports*. 2020;1(4):187-94. <https://doi.org/10.1007/s43154-020-00024-3>
- [3]. Ertan A, Klaus M, Adomaitis L, Christie EH. Regulating lethal autonomous weapon systems: exploring the challenges of explainability and traceability. 2024. <https://doi.org/10.1007/s43681-023-00261-0>
- [4]. Bo M. Autonomous Weapons and the Responsibility Gap in light of the Mens Rea of the War Crime of Attacking Civilians in the ICC Statute. *Journal of International Criminal Justice*. 2021;19(2):275-99. <https://doi.org/10.1093/jicj/mqab005>
- [5]. Conroy SK. Spotlight Session on Autonomous Weapons Systems at ICRC 34th International Conference. arXiv preprint arXiv:241108890. 2024. <https://doi.org/10.48550/arXiv.2411.08890>
- [6]. Enqvist, L. (2023). Human oversight in the EU Artificial Intelligence Act: What, when and by whom? *Law, Innovation and Technology*, 15(2), 508–535. <https://doi.org/10.1080/17579961.2023.2245683>
- [7]. Boutin B. (2023). State responsibility in relation to military applications of artificial intelligence. *Leiden Journal of International Law*;36(1):133-50. <https://doi.org/10.1017/S0922156522000607>
- [8]. Zurek T, Kwik J, van Engers T. Model of a military autonomous device following International Humanitarian Law. *Ethics and Information Technology*. 2023;25(1):15. <https://doi.org/10.1007/s10676-023-09682-1>
- [9]. Geiß R. State Control Over the Use of Autonomous Weapon Systems: Risk Management and State Responsibility. In: Bartels R, van den Boogaard JC, Ducheine PAL, Pouw E, Voetelink J, editors. *Military Operations and the Notion of Control Under International Law: Liber Amicorum Terry D Gill*. The Hague: T.M.C. Asser Press; 2020. p. 439-50. https://doi.org/10.1007/978-94-6265-395-5_21
- [10]. Sharikov, P. A. (2024). International regulations of lethal autonomous weapons systems: Transatlantic security dialogue. *World Economy and International Relations*, 68(12), 38–48. <https://doi.org/10.20542/0131-2227-2024-68-12-38-48>
- [11]. Gunawan Y, Aulawi MH, Anggriawan R, Putro TA. Command responsibility of autonomous weapons under international humanitarian law. *Cogent Social Sciences*. 2022;8(1):2139906. <https://doi.org/10.1080/23311886.2022.2139906>
- [12]. Hassan FM, Osman ND. AI-based autonomous weapons and individual criminal responsibility under the Rome Statute. *Journal of Digital Technologies and Law*. 2023;1(2):464-80. <https://cyberleninka.ru/article/n/ai-based-autonomous-weapons-and-individual-criminal-responsibility-under-the-rome-statute>
- [13]. Kwik J, Zurek T, van Engers T. Designing International Humanitarian Law into Military Autonomous Devices. *Coordination, Organizations, Institutions, Norms, and Ethics for Governance of Multi-Agent Systems XV*. 2022:1-18. https://doi.org/10.1007/978-3-031-20845-4_1
- [14]. Kahn L. Lethal autonomous weapon systems and respect for human dignity. *Frontiers in big data*. 2022;5:999293. <https://doi.org/10.3389/fdata.2022.999293>
- [15]. Klonowska K. Article 36: Review of AI Decision-Support Systems and Other Emerging Technologies of Warfare. In: Gill TD, Geiß R, Krieger H, Mignot-Mahdavi R, editors. *Yearbook of International Humanitarian Law, Volume 23 (2020)*. The Hague: T.M.C. Asser Press; 2022. p. 123-53. https://doi.org/10.1007/978-94-6265-491-4_6
- [16]. Szpak A. Legality of Use and Challenges of New Technologies in Warfare – the Use of Autonomous Weapons in Contemporary or Future Wars. *European Review*. 2020;28(1):118-31. <https://doi.org/10.1017/S1062798719000310>
- [17]. Suleiman A. Legal Accountability for Autonomous Weapon Systems in Counterterrorism under International Law. *International Journal of Science and Research Archive*. 2024;13(2):1604-16. <https://doi.org/10.30574/ijsra.2024.13.2.2585>
- [18]. McFarland T. Minimum levels of human intervention in autonomous attacks. *Journal of Conflict and Security Law*. 2022;27(3):387-409. <https://doi.org/10.1093/jcsl/krac021>
- [19]. O'Connell ME. Banning autonomous weapons: A legal and ethical mandate. *Ethics & International Affairs*. 2023;37(3):287-98. <https://doi.org/10.1017/S0892679423000357>
- [20]. McFarland T, Assaad Z. Legal reviews of in situ learning in autonomous weapons. *Ethics and Information Technology*. 2023;25(1):9. <https://doi.org/10.1007/s10676-023-09688-9>
- [21]. Cherneva B, Mitreva, P., Velez, D., & Zlateva, P. Legal aspects of artificial intelligence application in autonomous weapon systems. *Machine Learning and Artificial Intelligence*. 2026. <https://doi.org/10.3233/FAIA260034>
- [22]. Sauer F. Stepping back from the brink: Why multilateral regulation of autonomy in weapons systems is difficult, yet imperative and feasible. *International Review of the Red Cross*. 2020;102(913):235-59. <https://doi.org/10.1017/S1816383120000466>
- [23]. Schmitt MN. International Humanitarian Law and the Conduct of Cyber Hostilities: Quo Vadis? *Journal of International Humanitarian Legal Studies*. 2022;13(2):189-221. <https://doi.org/10.1163/18781527-bja10059>
- [24]. Hueso LC, de Ágreda ÁG. Criterios éticos y de derecho internacional humanitario en el uso de sistemas militares dotados de inteligencia artificial. *Novum Jus*. 2024;18(1):249-83. <https://doi.org/10.14718/NovumJus.2024.18.1.9>
- [25]. Taddeo M, Blanchard A. A Comparative Analysis of the Definitions of Autonomous Weapons Systems. *Science and Engineering Ethics*. 2022;28(5):37. <https://doi.org/10.1007/s11948-022-00392-3>
- [26]. Kwik J. A Practicable Operationalisation of Meaningful Human

- Control. Laws. 2022;11(3):43.
<https://doi.org/10.3390/laws11030043>
- [27]. Winter E. THE accountability of software developers for war crimes involving autonomous weapons: the role of the joint criminal enterprise doctrine. University of Pittsburgh Law Review. 2021;83(1):67-104. <https://doi.org/10.5195/lawreview.2021.822>
- [28]. Verdiesen I, Santoni de Sio F, Dignum V. Accountability and Control Over Autonomous Weapon Systems: A Framework for Comprehensive Human Oversight. Minds and Machines. 2021;31(1):137-63. <https://doi.org/10.1007/s11023-020-09532-9>
- [29]. Podar H, Colijn A. Technical risks of (lethal) autonomous weapons systems. arXiv preprint arXiv:250210174. 2025. <https://doi.org/10.48550/arXiv.2502.10174>
- [30]. Khalil A, Raj SAK. Assessing the legality of autonomous weapon systems: an in-depth examination of international humanitarian law principles. Law Reform. 2023;19(2):372-92. <https://doi.org/10.14710/lr.v19i2.58497>
- [31]. Devitt SK. Meaningful human command: Advance control directives as a method to enable moral and legal responsibility for autonomous weapons systems. Research Handbook on Meaningful Human Control of Artificial Intelligence Systems: Edward Elgar Publishing; 2024. p. 53-80. <https://doi.org/10.4337/9781802204131.00011>