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LEGAL AND ETHICAL ASPECTS OF THE USE OF ARTIFICIAL INTELLIGENCE IN THE MILITARY DOMAIN

Abstract

The development of artificial intelligence technologies has led to the emergence of autonomous weapons systems capable of conducting military operations without human intervention. While these systems are effective and reduce risks for soldiers, their emergence poses serious challenges to fundamental principles of international humanitarian law such as discrimination, proportionality and responsibility. This study uses a regulatory approach to analyze the extent to which international and national law may allow the use of autonomous weapons. The study reveals significant regulatory gaps and a high potential for violations of the law due to the moral, technical, and legal limitations of these systems. Therefore, a new, adaptive legal framework is needed, focused on protecting humanitarian values in the context of modern warfare.

Keywords: Autonomous weapons, Artificial intelligence, International humanitarian law, Accountability, Military regulation.

Introduction

The development of artificial intelligence technologies has changed the world's understanding of various aspects of life, including defense and security. Artificial intelligence is no longer used exclusively for civilian purposes, but is also beginning to be widely implemented in military systems in various countries. One of the concrete examples of the use of artificial intelligence in the army is the emergence of autonomous weapons, that is, weapons systems capable of identifying, selecting and hitting targets without direct human intervention. Carlo also explains that the advent of autonomous weapons is revolutionizing the way warfare is conducted[1]. These combat vehicles are no longer just tools for humans, but rather active participants capable of making independent decisions based on algorithms and data analysis. This phenomenon raises serious questions about the human role in the attack process, responsibility for the actions of autonomous systems, and the legitimacy of their use in accordance with international law, especially humanitarian law. In practice, autonomous weapons can operate with speed and accuracy beyond human capabilities. This provides strategic advantages to the countries that adopt it, such as attack effectiveness, reduced risk to soldiers, and real-time intelligence gathering. However, on the other hand, there are serious concerns about potential violations of the laws of war, the inability of the system to distinguish between combatants and non-combatants, as well as the loss of human control in the decision-making process concerning life and death, as also noted in [1]. International humanitarian law establishes the fundamental principles of warfare, including distinction, proportionality, and military necessity. These three principles require belligerents to distinguish between military targets and civilians, assess whether an attack is proportionate to the expected military benefit, and ensure that force is used only when militarily necessary. Autonomous weapons challenge these principles, especially when algorithms cannot accurately identify targets or fail to take

into account the human factor resulting from an attack. This situation is fueling a global debate about the ethics of using technology in warfare. Some countries support the development of autonomous weapons as part of military modernization, while others and a number of civil society organizations are calling for a complete ban on their use. Differences in the understanding and regulation of autonomous weapons add to the complexity of emerging legal issues, especially when this technology is used in transnational armed conflicts. Undoubtedly, artificial intelligence has transformed the traditional military paradigm. The integration of AI into weapons systems has created a new phenomenon that has not yet been fully resolved by existing legislation. According to Mela (2024), this sparked a discussion about the need to create new legal instruments specifically regulating the existence and use of autonomous weapons.

The use of autonomous weapons also raises the issue of legal liability. In conventional weapons systems, responsibility for violations of the laws of war may be assigned to the contractor, commander, or the State. However, when an autonomous system commits actions that result in civilian casualties or disproportionate destruction of civilian infrastructure, it is difficult to determine who should be responsible: a system engineer, an algorithm programmer, an end user, or a state that owns weapons. This situation poses a serious dilemma for experts in the field of military law and politicians. (Unanda, 2019) also noted that there is a desire to keep pace with technological developments in order to achieve military superiority. On the other hand, there is a moral and legal responsibility to ensure that all forms of violence remain within the legal framework that defends human dignity. The conflict between these two interests creates an urgent need to review the relevant legal norms. Although a number of international treaties, such as the Geneva Conventions, laid the foundation for modern laws of war, these documents were drafted before the advent of autonomous weapons technology. As a result, there are regulatory gaps that can be exploited or even abused by State and non-State actors. This uncertainty can negatively affect international stability and lead to new, difficult-to-control conflicts, as explained in [3].

Goal

The purpose of this article is to provide a comprehensive understanding of the legal issues arising from the development of artificial intelligence technologies in the military field, especially with regard to the use of autonomous weapons. The article is aimed at critically examining the extent to which international humanitarian law, human rights law, and national law are able to take into account and respond to the emergence of weapons systems capable of operating autonomously without direct human intervention, as indicated in (Anindita et al., 2025). In addition, the article aims to identify and analyze various regulatory issues that arise in ensuring accountability, legality and legitimacy of the use of autonomous weapons in armed conflicts. Another goal is to raise awareness among readers, including scientists, policy makers, and the general public, about the importance of creating an adaptive legal framework focused on protecting human dignity in the face of the rapid development of military technology. Through an in-depth legal and ethical analysis, the article also seeks to offer constructive recommendations on the future direction of regulation of autonomous weapons, including the need to create new international norms capable of eliminating the existing legal vacuum, as explained in the work (Carlo, 2023).

Relevance of the study

The relevance of research on the problems of military law in the era of artificial intelligence, especially with regard to the dilemma of the use of autonomous weapons, is due to the fact that technological progress is developing much faster than the legal norms governing it are being created. This phenomenon creates a significant regulatory gap, especially when technology affects the fundamental humanitarian aspects of war, such as life-and-death decisions that can be made by machines without human intervention. The existence of

autonomous weapons raises serious concerns about violations of key principles of international humanitarian law, such as the principles of discrimination, proportionality and the legal responsibility of perpetrators[10]. Without clear and adaptive legal provisions, the use of autonomous weapons can lead to new forms of violence that are difficult to justify from a legal and moral point of view. In addition, countries around the world are currently using different approaches to the development and application of AI-based military technologies, which creates potential power imbalances and international legal conflicts. In this situation, this study is crucial to identify existing gaps in legislation and stimulate global discussion on the need to update or even create international legal instruments that can adapt to the challenges of the times. This urgency is also reinforced by the growing trend of major powers to integrate AI into their weapons systems, which, if not addressed immediately, could trigger an uncontrolled arms race and endanger the stability of world peace.

Literary review

The rapid development of artificial intelligence technologies has prompted researchers, scientists, and policy makers to review various international legal norms, especially those governing military law and international humanitarian law. Meanwhile, from the perspective of international law, Unanda (2019) makes an important contribution by describing how international law, including the law of armed conflict, applies to cyber operations and autonomous technologies, although it does not yet fully cover the lethal aspects of autonomous weapons. In a number of other legal works, such as the research of Michael N. Schmitt and Heather Harrison Dinniss discuss how existing legal interpretations can be applied or need to be revised to address these new challenges. The review also examines works on regulatory approaches to AI-based military technologies, including the views of the International Committee of the Red Cross (ICRC), which in its reports actively advocates restrictions on the use of autonomous weapons. The literature that examines this issue from the perspective of national law also makes an important contribution, especially with regard to the readiness of national legal systems to adopt and regulate new military technologies. Legal research in Indonesia on this issue is still limited, but there is beginning to be interest in exploring the possibility of integrating the principles of international humanitarian law into a national legal system capable of responding to the challenges of using advanced military technologies[7]. (Mela, 2024) Thus, this literature review demonstrates the urgent need to develop a more adaptive and flexible legal approach to the use of artificial intelligence technologies in military operations, both in terms of strengthening international norms, creating a national legal framework, and ethical reflections on the changing paradigm of warfare in the digital age.

Research methods

This study uses a regulatory and legal approach, which is a method of legal research based on the study of literature and analysis of applicable legal norms, both contained in national legislation and in international legal instruments. This approach was chosen because the study aims to explore how military law and international humanitarian law are responding to the emergence of artificial intelligence technologies, especially autonomous weapons, and to identify legal problems arising from their use, as explained in a study conducted by Yunanda (Yunanda, 2019). The data used is derived from primary legal materials such as international treaties (for example, the Geneva Conventions, Additional Protocol I and the legal instruments of the Convention on Certain Conventional Weapons), official resolutions and reports of international organizations such as the United Nations and the ICRC, as well as relevant national regulations or legal documents. In addition, secondary legal materials in the form of books, scientific journals, previous research results, expert opinions, and other academic documents are used as a basis for strengthening argumentation. Data collection is carried out through a systematic study of the literature by analyzing legal documents, academic articles and the latest scientific literature related to the research topic. All data was analyzed

qualitatively, namely by reviewing, interpreting, and evaluating legal norms and emerging international practices in order to gain a comprehensive understanding of the legal and ethical dilemmas of using autonomous weapons on the battlefield (Masihna et al., 2024). The interview method was not used in this study, as the focus was on the normative and theoretical aspects of the applicable legal system, rather than empirical data from participants using this technology.

Discussion and results

The development of artificial intelligence technologies has brought significant changes to the modern battlefield, especially with the advent of autonomous weapons systems capable of identifying, tracking and hitting targets without human intervention. On the one hand, the availability of this technology increases operational efficiency and potentially reduces casualties among soldiers. However, on the other hand, serious doubts have arisen about the compliance of autonomous weapons with the basic principles of international humanitarian law, such as the principles of distinction, proportionality and individual responsibility. (Purnomo, 2023) argues that when algorithmic systems determine targets without moral evaluation, the risk of violations of the law and fatal errors increases, especially in dynamic and complex combat situations. The use of autonomous weapons poses a serious challenge to the principle of distinction in the laws of war, namely the duty to distinguish between combatants and non-combatants[8]. Machines programmed to identify threats based on behavioral patterns or visual images are not always able to understand the social nuances and situations on the ground, which often require human assessment. When life and death decisions are in the hands of algorithms, the likelihood of mistaken identity increases, especially in situations where civilians and combatants are mixed in the same geographical area, as indicated in (Mela, 2024). This creates a risk of civilian deaths that should not have been involved in an armed conflict[9].

The principle of proportionality is also under considerable pressure when working with autonomous systems. This principle requires that a military attack does not cause excessive harm to the civilian population or civilian objects compared to the expected military benefit. In practice, proportionality assessments rely heavily on the subjective, moral, and tactical judgments of the field commander. Machines that only process data and algorithms are unable to assess the appropriateness or humanity of actions, especially when the intelligence information used is limited or inaccurate. Failure of the system to assess moral complexity can lead to serious violations of this principle. According to Passar and Erwin (2021), another fundamental problem is the legal liability for the actions of autonomous weapons. If the system commits an illegal attack or causes disproportionately great harm, it is difficult to determine who is legally responsible. Military commanders, technicians, algorithm developers, and users have complex relationships with the system. When no one directly controls the attack, the gap in legal responsibility becomes significant, as also explained in Carlo's study (Carlo, 2023). This could create a legal vacuum that would jeopardize the application of the principle of accountability in international criminal law.

Many countries and international organizations, such as the International Committee of the Red Cross (ICRC), are calling for a restriction or moratorium on the use of autonomous weapons until adequate international regulation is developed. However, the reaction of the major Powers was inconsistent. Some countries view this technology as an inevitable part of the military revolution and reject a total ban, while others insist on new international treaties that could regulate or even prohibit the development and use of lethal autonomous weapons. According to Masihna et al. (2024), these different positions indicate a lack of global consensus on how legislation should take these technological developments into account. From the point of view of national law, most countries do not yet have clear rules governing the use of autonomous weapons. This creates a "grey area" in the application of the principles of national

legislation on war to increasingly complex weapons systems. Existing internal rules, as a rule, still use outdated frameworks that involve direct human involvement in military decision-making. (Anindita et al., 2025). It was noted that the unpreparedness of the national legal system for the era of autonomous gun ownership adds to the list of problems that must be overcome to maintain the rule of law on the battlefield. Apart from the significant legal aspects, technical issues cannot be ignored. Many autonomous systems are still under development or testing and, therefore, cannot be fully tested in realistic war scenarios. This complicates the legal assessment of their effectiveness, reliability, and ethical risks. Technological uncertainty leads to the fact that many legal aspects are based on forecasts and assumptions, rather than on sufficient empirical data. (Masihna et al., 2024) explain that in such situations, it is extremely important to be careful so that the law does not lag behind technological development. The debate about the legality of autonomous weapons also touches on deeper ethical and humanitarian aspects. Many question the wisdom of handing over the decision to kill to machines, regardless of how advanced the technology is. The humanitarian principles underlying humanitarian law are based on the understanding that people are morally responsible for their actions. When the human role is replaced by systems devoid of empathy or moral understanding, fundamental human values can be undermined. This increases the risk of further dehumanization of the war. Anindita et al. (2025) argue that although some technology developers claim the possibility of programming autonomous weapons systems in accordance with international law, technical and operational realities reveal many unresolved issues. Even the most complex systems are not able to understand legal language and moral values the way humans do. Codes of ethics and legal norms are not just technical instructions, but the result of social, historical, and cultural constructs that are difficult to reduce to algorithms alone. Therefore, claims that AI can autonomously comply with the laws of war still require critical and ongoing testing, as Purnomo (2023) notes.

Conclusion

This article concludes that the use of autonomous weapons based on artificial intelligence presents complex legal and ethical dilemmas in the context of armed conflict. Existing legal systems, both international and national, are not yet fully capable of taking these technological developments into account, especially in terms of respecting the principles of distinction, proportionality and responsibility. The lack of clear regulations increases the risk of lawlessness and dehumanization in the context of war. Therefore, comprehensive and interdisciplinary legal reform is needed to ensure that advances in military technology remain within the framework of law and humanity.

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ЖАСАНДЫ ИНТЕЛЛЕКТТІ ӘСКЕРИ САЛАДА ҚОЛДАНУДЫҢ ҚҰҚЫҚТЫҚ ЖӘНЕ ЭТИКАЛЫҚ АСПЕКТІЛЕРІ

Түйін

Жасанды интеллект технологиясының дамуы адамның араласуынсыз әскери операцияларды жүргізуге қабілетті автономды қару-жарақ жүйелерінің пайда болуына әкелді. Бұл жүйелер сарбаздар үшін тиімділікті қамтамасыз етеді және тәуекелдерді азайтады, бірақ олардың пайда болуы халықаралық гуманитарлық құқықтың кемсітушілік, пропорционалдылық және жауапкершілік сияқты негізгі принциптеріне үлкен қиындықтар туғызады. Бұл зерттеуде автономды қаруды қолдануға халықаралық және ұлттық құқықтың қаншалықты рұқсат ететінін талдау үшін нормативтік-құқықтық тәсіл қолданылады. Зерттеу осы жүйелердің моральдық, техникалық және құқықтық шектеулеріне байланысты реттеудегі Елеулі олқылықтарды және заң бұзушылықтардың жоғары әлеуетін анықтайды. Сондықтан қазіргі заманғы соғыс жағдайында гуманитарлық құндылықтарды қорғауға бағытталған жаңа, бейімделгіш құқықтық негіз қажет.

Кілттік сөздер: автономды қару жүйелері, жасанды интеллект, халықаралық гуманитарлық құқық, құқықтық жауапкершілік, әскери-құқықтық реттеу.

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ПРАВОВЫЕ И ЭТИЧЕСКИЕ АСПЕКТЫ ПРИМЕНЕНИЯ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ВОЕННОЙ СФЕРЕ

Аннотация

Развитие технологий искусственного интеллекта привело к появлению автономных систем вооружения, способных проводить военные операции без вмешательства человека. Хотя эти системы обеспечивают эффективность и снижают риски для солдат, их появление создает серьезные проблемы для фундаментальных принципов международного гуманитарного права, таких как дискриминация, соразмерность и ответственность. В данном исследовании используется нормативно-правовой подход для анализа того, в какой степени международное и национальное право могут допускать использование автономного оружия. Исследование выявляет значительные пробелы в регулировании и высокий потенциал для нарушений права из-за моральных, технических и правовых ограничений этих систем. Поэтому необходима новая, адаптивная правовая основа, ориентированная на защиту гуманитарных ценностей в контексте современной войны.

Ключевые слова: автономные системы вооружения, искусственный интеллект, международное гуманитарное право, юридическая ответственность, военно-правовое регулирование.