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INTERNATIONAL LEGAL REGULATION OF ILLEGAL TRAFFICKING OF MILITARY ROBOTS

INTRODUCTION. *This article provides a critical analysis of the international legal aspects of regulating illicit trafficking in military robots, which is a new and rapidly growing threat to global stability. The relevance of this research is driven by technological revolution in the military sphere, characterized by autonomous systems capable of identifying targets and using lethal force independently, coupled with a parallel formation of a global black market for their illegal distribution. The authors identify a deep crisis within the current framework of international law to address this challenge. Traditional approaches, including norms of international humanitarian law and the Convention on Certain Conventional Weapons, as well as multilateral export controls, demonstrate systemic weaknesses. Their main shortcomings are their fragmentation and their primary focus on states and conventional weapons. Their chronic failure to keep pace with the rate of technological advancement gives rise to a number of fundamental legal problems. These include the absence of universal legal definitions and classification criteria for autonomous systems, regulatory gaps that allow non-state actors, such as terrorist groups and organized criminal networks, to gain access to critical components and ready-made platforms without consequences,*

and ultimately, a lack of clarity regarding attribution and enforcement of liability for damage caused by autonomous systems circulating in the black market. As a strategic response, the article argues for the urgent need to develop a new, comprehensive international legal approach that should include the elaboration and adoption of a multilateral treaty establishing clear prohibitions and harmonizing terminology, creating effective control and verification mechanisms. At the same time, a set of complementary measures are proposed, including strengthening national legislation, modernizing customs procedures and financial oversight, fostering enhanced international cooperation in incident investigation and data exchange. The goal of the research is to create a conceptual basis for establishing a strong legal barrier against proliferation of these dangerous technologies and protecting the fundamental principles of international law in the era of autonomous weapons.

MATERIALS AND METHODS. *This research is based on a comprehensive doctrinal and analytical methodology, which is typical of fundamental legal work in the field of international law. It is both theoretical and applied, and includes an in-depth analysis of existing legal norms, such as international treaties, conventions, charters of international organizations,*

and documents from international conferences. It also includes analysis of theoretical approaches to problem research in scientific monographs, articles published in peer-reviewed academic journals. The research also examines practical approach, such as public reports from States. Finally, the research aims to develop scientifically sound proposals for improving legal regulation in the area under study. The study primarily employs a qualitative approach, which focuses on interpreting legal texts, identifying semantic conflicts, assessing the effectiveness of legal mechanisms, and forecasting the evolution of regulations. The main research methods are both general scientific methods (analysis, synthesis, induction, deduction) and private scientific methods (formal legal analysis, risk-based approach).

RESEARCH RESULTS. The research concludes that existing international law is fundamentally inadequate to address the illicit trafficking of military robots. Key deficiencies include the absence of universally binding definitions, ineffective control over dual-use components and non-state actors, and unworkable accountability mechanisms for autonomous systems. To address this, the study proposes a comprehensive legal framework centered on a new international treaty, supported by enhanced national regulations, modernized monitoring tools, and stronger international cooperation.

DISCUSSION AND CONCLUSIONS. This analysis concludes that the current frameworks of international law are fundamentally unprepared to deal with the distinct and rapidly evolving challenges posed by the illegal spread of military robotics. Traditional arms control and humanitarian law, with their static

and state-centric foundations, struggle to accommodate the reality of these rapidly developing, commercially available, software-driven technologies. This gap has led to significant governance deficits, allowing critical vulnerabilities to persist. Therefore, this study advocates for a necessary shift in paradigm towards a more coherent and integrated approach to governance. This new approach should thoughtfully combine several key elements: an international treaty to establish clear legal prohibitions and control measures must be integrated with stronger complementary measures. These key measures include harmonizing national regulatory frameworks, implementing strategic trade controls targeting critical algorithms and supply chain components, and formalizing international forensic and investigative cooperation to ensure credible enforcement and accountability. Developing such a comprehensive and adaptive regime is crucial for the international community to mitigate profound security risks arising from the uncontrolled proliferation of autonomous military capabilities.

KEYWORDS: combat robot, military robotics, military robot, humanitarian law, legislation, artificial intelligence, international law, robot, digital technologies

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МЕЖДУНАРОДНО-ПРАВОВОЕ РЕГУЛИРОВАНИЕ НЕЗАКОННОГО ОБОРОТА ВОЕННЫХ РОБОТОВ

ВВЕДЕНИЕ. Данная статья посвящена критическому анализу международно-правовых аспектов регулирования незаконного оборота военных роботов. Актуальность исследования обусловлена технологической революцией в военной сфере, характеризующейся появлением автономных систем, способных самостоятельно идентифицировать цели и применять летальную силу, а также параллельным формированием глобального теневого рынка их незаконного распространения. Авторы констатируют глубокий кризис существующей системы международного права перед лицом новых вызовов в сфере технологий. Традиционные режимы, включая нормы международного гуманитарного права, Конвенцию о конкретных видах обычного оружия и многосторонние договоренности об экспортном контроле, демонстрируют свою системную неэффективность. Их ключевые недостатки заключаются во фрагментарности, ориентации преимущественно на государства и классические виды вооружений, а также в хроническом отставании от темпов технологического развития. Это порождает ряд фундаментальных правовых проблем, среди которых можно выделить отсутствие универсальных юридических дефиниций и критериев классификации автономных систем, правовые пробелы, позволяющие негосударственным акторам (террористическим группам, организованной преступности) беспрепятственно получать доступ к критическим компонентам и готовым платформам, и, наконец, полную неопределенность в вопросах установления и реализации ответственности за ущерб, причиненный в результате действий автономных систем, обращающихся на черном рынке. В качестве стратегического ответа на эти вызовы в статье обосновывается необходимость выработки нового, комплексного международно-правового подхода. Его ядром должна стать разработка и принятие специализированного многостороннего договора, который установил бы четкие запреты, унифицировал терминологию и создал бы действенные механизмы контроля и верификации. Параллельно предлагается комплекс

сопутствующих мер по усилению национального законодательства, а также развитию оперативного международного сотрудничества в расследовании инцидентов и обмене данными. Целью работы является формирование концептуальной основы для создания устойчивого правового барьера против распространения опасных технологий и защиты основных принципов международного правопорядка в эпоху развития автономных вооружений.

МАТЕРИАЛЫ И МЕТОДЫ. В основе данного исследования лежит комплексная доктринально-аналитическая методология, которая характерна для фундаментальных юридических работ в области международного права. Исследование носит теоретико-прикладной характер и включает в себя как глубокий анализ уже существующих правовых норм (международные договоры, конвенции, уставы международных организаций, документы международных конференций и др.), теоретических подходов к исследованию проблемы (научные монографии, статьи в рецензируемых академических журналах и др.) и практических подходов (открытые отчеты государств и др.), так и разработку научно обоснованных предложений, направленных на совершенствование правового регулирования. Исследование преимущественно использует качественный подход, который фокусируется на интерпретации правовых текстов, выявлении смысловых коллизий, оценке эффективности правовых механизмов и прогнозировании развития регулирования. Основными методами исследования являются как общенаучные методы (анализ, синтез, индукция, дедукция), так и частнонаучные методы (формально-юридический анализ, риск-ориентированный подход).

РЕЗУЛЬТАТЫ ИССЛЕДОВАНИЯ. Авторы приходят к выводу о системной неэффективности существующих норм международного права в сфере противодействия незаконному обороту военных роботов. К ключевым правовым проблемам относятся: отсутствие универсальных юридически обязательных дефиниций и критериев классификации; неспособность действующей

щих режимов контролировать оборот компонентов двойного назначения и деятельность негосударственных субъектов; а также работоспособность традиционных механизмов привлечения к ответственности за действия автономных систем. В целях противодействия этим вызовам научная работа обосновывает необходимость формирования комплексного международно-правового подхода. Его стержнем должно стать заключение нового специализированного международного договора, который дополнится мерами по гармонизации национального законодательства, внедрению современных инструментов мониторинга и укреплению межгосударственного оперативного взаимодействия.

ОБСУЖДЕНИЕ И ВЫВОДЫ. Анализ ситуации позволяет сделать вывод о том, что существующие нормы международного права не могут эффективно решать актуальные проблемы, связанные с незаконным распространением военных роботов. Традиционные механизмы контроля над вооружениями и нормы гуманитарного права, которые были разработаны на основе государство-центричной модели, с трудом адаптируются к новым реалиям, связанным с быстрым развитием технологий и их доступностью на рынке. Это приводит к правовым пробелам и уязвимостям в регулировании. В связи с этим необходимо пересмотреть подходы к управлению и разработать более комплексный

и последовательный подход. Он должен включать в себя унификацию национальных законов и правил, внедрение стратегического мониторинга оборота, который будет сосредоточен на критически важных этапах и компонентах логистической цепи; официальное оформление международного взаимодействия в сфере судебных экспертиз и расследований для обеспечения эффективного правоприменения и прозрачности. Создание такого всеобъемлющего и гибкого механизма имеет большое значение для международного сообщества в контексте снижения серьезных угроз безопасности, связанных с неконтролируемым распространением автономных военных технологий.

КЛЮЧЕВЫЕ СЛОВА: боевой робот, военная робототехника, военный робот, гуманитарное право, законодательство, искусственный интеллект, международное право, робот, цифровые технологии

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Авторы заявляют об отсутствии конфликта интересов.

I. Introduction

Recently, there has been rapid development of autonomous military robots, leading to significant changes in the nature of modern conflicts. This is confirmed by a substantial increase in investments in this field. For instance, over the past decade, U.S. expenditures on the development of autonomous systems have grown more than sixfold. Unmanned aerial vehicles (UAVs) already constitute one-third of the U.S. operational combat aviation fleet and may become the primary means of conducting military operations in the future¹.

A clear trend toward the active integration of unmanned aerial vehicles into the armed forces of various nations is evident. Drones have become not only an effective intelligence-gathering tool but also a strike asset potentially capable of independently identifying targets for destruction and employing various types of weapons, including weapons of mass destruction [Glebov 2018:104-116].

However, this technological revolution is accompanied by the emergence of new challenges, including the appearance of a global market for the illicit trafficking of military robots. For the purposes of this study, a “military robot” shall mean a mobile (ground-based, aerial, maritime, or underwater) sys-

¹ Defense Department. Annual Defense Budget: Defense Department’s Annual Performance Plan. 2017. URL: https://comptroller.war.gov/Portals/45/Documents/defbudget/fy2017/fy2017_Budget_Request_Overview_Book.pdf (accessed date: 17.10.2025).

tem that possesses the ability to move autonomously or be remotely controlled and to perform tasks in a combat environment, is equipped with sensors, actuators, and an information processing system enabling it to engage objects or enemy personnel, and is intended or may be used for military purposes. The term “autonomous weapon system” is used herein as a subcategory of military robots, characterized by the ability to independently (without operator intervention) select and engage targets. This article focuses on issues common to all categories of military robots, while paying particular attention to systems with a high degree of autonomy due to their specific risks. By “illicit trafficking”, we mean the development, production, transfer, acquisition, or use of such systems in violation of national legislation and international norms. This problem poses a serious threat to international security and stability. The potentially uncontrolled proliferation of autonomous weapon systems could lead to regional destabilization, terrorist acts, and grave human rights violations. At the same time, as will be shown below, the extent of the actual threat and the necessity of prohibitive measures are subjects of lively debate among states. Currently, there are no clear mechanisms establishing responsibility for such actions.

The existing system of international legal norms, including International Humanitarian Law (IHL), arms control regimes such as the Convention on Certain Conventional Weapons (CCW) and its Protocols², export controls (the Wassenaar Arrangement³), and UN Security Council resolutions, may prove insufficient to combat the illicit trafficking of autonomous robotic systems.

Many researchers consider the autonomy of combat robots (i.e., their ability to act without constant human oversight) to be the primary problem. It is argued that under such conditions, robots cannot change their mission in response to changing

situations or humanitarian circumstances, which contravenes the principles of distinction, proportionality, and military necessity enshrined in Additional Protocols I and II to the Geneva Conventions of 1949⁴.

Furthermore, there is a regulatory legal problem caused by the absence of universal definitions for autonomous robotic systems, uniform standards for their classification, and special international treaties covering the entire lifecycle of military robots from development to deployment.

The situation is complicated by the lack of a unified approach to studying this problem. While the works of authors such as Paul Scharre [Scharre 2018] and Markus Wagner [Wagner 2014:1371-1422], as well as the scientific project of the Russian Foundation for Basic Research No. 18-29-16129, “Doctrinal and Legal Framework and Moral and Ethical Standards for the Use of Autonomous Robotic Systems in Social and Military Spheres”⁵, provide detailed analyses of autonomous systems' compliance with IHL and the ethical aspects of their use, the problem of illicit trafficking in autonomous robotic systems remains relatively underexplored. Existing publications focus primarily on the legality of using combat robots within the framework of state military operations, whereas the issue of illicit robotics trafficking is addressed only fragmentarily.

Among the pressing issues are cross-border supplies of dual-use components; the involvement of non-state actors, such as terrorist groups and organized criminal networks, in the dissemination of technologies; deficiencies in the customs control system; and questions of accountability for incidents occurring beyond national borders.

Initiatives such as Russia's “Concept for the Development of Regulation of Relations in the Field of Artificial Intelligence and Robotics until 2024”⁶ are aimed primarily at technological advancement

² Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which may be deemed to be Excessively Injurious or to have Indiscriminate Effects (with Protocols I, II, III as amended, IV and V). 1980. URL: <https://legal.un.org/avl/ha/cprccc/cprccc.html> (accessed date: 16.01.2026).

³ Wassenaar Arrangement. URL: <https://www.wassenaar.org/> (accessed date: 16.01.2026).

⁴ International Committee of the Red Cross. Protocols Additional to the Geneva Conventions of 12 August 1949. 2010. URL: https://www.icrc.org/sites/default/files/external/doc/en/assets/files/other/icrc_002_0321.pdf (accessed date: 16.01.2026).

⁵ Doktrinal'no-pravovye osnovy i нравstvenno-eticheskie standarty primeneniya avtonomnykh robotizirovannykh apparatov v social'noj i voennoj sfere [Doctrinal and Legal Framework and Moral and Ethical Standards for the Use of Autonomous Robotic Systems in Social and Military Spheres]. – *Rossijskij fond fundamental'nyh issledovanij* [Russian Foundation for Basic Research]. 2018. Grant No. 18-29-16129. (In Russ.)

⁶ Rasporyazhenie Pravitel'stva RF ot 19 avgusta 2020 g. № 2129-r [Decree of the Government of the Russian Federation dated August 19, 2020 No. 2129-r]. – *Sobranie zakonodatel'stva RF* [Collection of legislation of the Russian Federation]. 2020. No. 35. Art. 5593. (In Russ.)

rather than at creating barriers to the unlawful use of such technologies. This underscores the need for international coordination of national measures in this area.

The scientific novelty of this research lies in its comprehensive analysis of the problems associated with the illicit trafficking of military robots as a distinct legal phenomenon. The study systematizes existing gaps in international control regimes and, considering various state positions, proposes model solutions for their universal regulation. Specifically, the study proposes establishing a convention-based prohibition on the transfer of offensive autonomous systems to non-state actors, as well as creating an international mechanism for monitoring supply chains of robotic components.

The relevance and urgency of conducting such research are driven by technological, humanitarian, and geopolitical factors. The technological factor includes the rapid advancement of artificial intelligence capabilities, which outpaces the adaptation of legal norms. The humanitarian aspect implies that equipping drones with weapons of mass destruction without human involvement could lead to the inability to correct erroneous commands or halt attacks should the situation change. Finally, the geopolitical dimension of the problem lies in the fact that the uncontrolled proliferation of autonomous robotic systems threatens strategic stability and potentially facilitates terrorist organizations' access to modern means of warfare.

Considering these concerns, the purpose of this article is to develop a scientifically grounded concept for international legal countermeasures against the illicit trafficking of military robots. The concept includes: 1) the unification of definitions and criteria that determine which actions are unlawful with respect to autonomous military robots; 2) the modernization of export control and customs monitoring regimes; 3) the introduction of multi-level accountability for violations at the state level as well as at the corporate and individual levels; and 4) the establishment of an international registry of incidents and mechanisms for their investigation.

The main scientific problem is that with technological advancement, non-state actors gain increasing opportunities to acquire and use autonomous offensive systems through shadow channels. Existing international legal norms may prove incapable of effectively responding to these trends, given the absence of specific prohibitions, verification procedures, and enforcement mechanisms that could control such actions.

II. The concept and classification of military robot

An examination of international agreements, national laws, and theoretical works has revealed that there is no single, legally codified definition of the term "military robot". Instead, three main approaches to its interpretation can be identified.

The functional approach focuses on the system's ability to perform tasks in combat conditions with a certain degree of autonomy, where human involvement should be minimal or absent altogether [Russell 2022:19-24]. A key aspect of this approach is the system's level of autonomy, which may range from remotely operated to fully autonomous [Sharre 2018]. This is particularly relevant with respect to critical functions such as target detection, the decision to use force, and direct engagement with a target. This approach is widely used in military doctrines, for example, in documents of NATO and the U.S. Department of Defense, as well as in discussions on lethal autonomous weapons systems (LAWS) under the CCW [Horowitz, Sharre 2015]. However, problems arise since the boundaries of system autonomy are not always clearly defined, as well as the subjectivity involved in determining when a "critical decision" is made.

At the core of the concept of a military robot lies the technological approach, which views it as a combination of physical and software components, including sensors (e.g., detectors, cameras, radars), actuators (e.g., manipulators, weapon systems), information processing systems (including artificial intelligence algorithms), and mobility capabilities (ground, air, sea, underwater) [Krishnan 2016]. This approach is widely used in technical standards and regulations, as well as in export control documents that govern specific technologies and components [Aubin, Idiart 2016]. However, this approach has its drawbacks. It rapidly becomes outdated and may not always encompass all continuously evolving technologies. Furthermore, within the technological approach, it is often difficult to distinguish military systems from commercial drones or dual-use robots.

Under the legal approach, the concept of a "military robot" is defined through characteristics that have direct relevance to the application of existing legal norms or the development of new ones [Boothby 2009]. The primary focus is on the system's intended purpose [Dinstein 2022]: it may be designed or used exclusively or primarily for military objectives. The

nature of the system's impact on the environment is also considered, its ability to inflict physical damage or disable enemy objects or personnel, either directly or indirectly. The potential for violations of international humanitarian law is analyzed [Anderson 2014:386-411], as the system's design or software code may not comply with the principles of international humanitarian law such as the principles of distinction, proportionality, and military necessity. Specific risks associated with the circulation of such systems such as features that may render them attractive for illicit proliferation or use (e.g., small size, component availability, difficulty of detection) are also examined [Ventura 2018]. This approach is most relevant for the purposes of this study, but it faces the challenge of the lack of consensus on key characteristics and their significance.

The reasons for the absence of a unified definition are not only technical but also political. Many states (including Russia and the United States) express concern that a premature or overly broad definition could limit defense innovation and create competitive advantages for dishonest actors. Russia, in particular, in its documents within the Group of Governmental Experts (GGE) of the CCW, emphasizes the need to maintain "human control" over the use of force, but opposes a total ban on autonomous systems, proposing instead the development of political and technical regulatory measures⁷. The United States takes a similar position, stressing the sufficiency of existing IHL norms, provided they are adapted to new circumstances⁸. At the same time, a number of states and NGOs insist on the development of a legally binding instrument prohibiting fully autonomous systems⁹.

The diversity of approaches to defining "military robot" is not merely a theoretical concept. It has serious legal and practical implications for regulating the unlawful use of such devices [Geiss, Lahmann 2017:371-404]. Gaps and contradictions exist within the legal framework, leading to ambiguity in determining the status of various systems. This allows the same objects to fall under regulation in one jurisdic-

tion but not in another. For example, a drone capable of autonomous flight but not equipped with weapons may be considered a military robot in the producing country but a commercial product in the importing country, thereby facilitating its illicit circulation. Dual-use systems and their components, which are actively used in the shadow market, are particularly vulnerable [Bunker, Sullivan 2021]. The uncertainty regarding their status complicates the qualification of actions involving them as unlawful [Malsch 2013:461-486].

Equally significant is the question of the applicability of existing norms. After all, the effective application of fundamental IHL norms, as well as arms control regimes, depends on whether a particular system falls under existing definitions of weapons or military equipment [Schmitt 2013]. Disagreements in approaches create opportunities to circumvent restrictions. For instance, if a system is not classified as a weapon due to the absence of built-in means of destruction, but can be quickly equipped with such means by a non-state actor, existing arms embargoes may prove inapplicable.

In addition, attention must be drawn to the difficulties that arise when developing new regulatory rules [Rosert, Sauer 2019:370-375]. Attempts to create a special international legal instrument to control the circulation of military robots face a serious obstacle – the inability to reach agreement on the subject matter of regulation. Debates within the GGE vividly demonstrate how disagreements over the understanding of a key term impede progress. The absence of a clear definition of "military robot" renders attempts to establish prohibitions or restrictions on its illicit circulation futile.

Furthermore, an important component of the problem is the difficulty of establishing responsibility, as uncertainty in the identification of the object complicates the attribution of liability for unlawful acts involving it [Crootof 2015:1347-1402]. If the status of a system is in doubt, it becomes more difficult to prove a violation of a specific norm regulating the circulation of arms or military equipment.

⁷ Mako G. No New Rules Needed: Russia's Minimalist Vision of Human Oversight for LAWS. URL: <https://lieber.westpoint.edu/no-new-rules-needed-russias-minimalist-vision-human-oversight-for-laws/> (accessed date: 15.04.2026).

⁸ CCW: U.S. Statement on Consideration of the GGE Report on Laws. – *U.S. Mission to International Organizations in Geneva*. URL: <https://geneva.usmission.gov/2019/11/20/ccw-u-s-statement-on-consideration-of-the-gge-report-on-laws/#search> (accessed date: 15.04.2026).

⁹ Human Rights Watch. Statement to Convention on Conventional Weapons Annual Meeting Discussion on Lethal Autonomous Weapons Systems. URL: <https://www.hrw.org/news/2024/11/14/statement-convention-conventional-weapons-annual-meeting-discussion-lethal> (accessed date: 15.04.2026).

Consequently, the lack of a single, functional, and legally defined concept of “military robot” is not only a theoretical but also a practical problem that hinders effective counteraction to its unlawful use.

This underscores the need to develop a universal definition or, at a minimum, a set of key characteristics (autonomy in performing critical tasks, military purpose, capacity to cause harm, specific risks of uncontrolled proliferation) that could serve as a basis for adapting existing and creating new international legal control mechanisms. At the same time, any definitions must be developed by consensus, taking into account the interests of all groups of states, and not imposed unilaterally.

An examination of existing developments and theoretical approaches has shown that military robotic systems exhibit great diversity. This creates significant difficulties in developing effective legal measures to counter their unlawful use.

One of the key classification criteria directly related to legal risks is the degree of decision-making independence, especially concerning the use of force [Begishev 2021:185-201]. This criterion ranges from systems requiring constant operator control (e.g., most contemporary armed unmanned aerial vehicles) to automated platforms capable of performing tasks without direct human involvement (e.g., certain air defense systems), and even to hypothetical fully autonomous systems that could operate without human intervention. As autonomy increases, the challenges of complying with IHL principles and establishing accountability become more acute, significantly raising the risk that such systems may enter the illicit market.

A key factor influencing the situation is the operational environment. Air systems, particularly lightweight and medium UAVs, dominate illicit circulation. They have become so popular due to their affordability, potential for covert transportation, and versatility. Ground, naval, or space-based robots present other, often more localized, risks.

When considering channels of illicit proliferation, it is important to account for the level of technological sophistication and the origin of the systems. High-tech, specialized military systems, while potentially subject to targeted leaks or theft, are less susceptible to mass shadow market circulation. In the contemporary world, the greatest threat is posed by systems based on commercial dual-use platforms such as civilian drones and robots that can be easily modified for military purposes by adding weapons or specialized software [Springer 2013].

The mass production of such systems, their relatively low cost, the lack of strict accountability, and global supply chains create unique opportunities for non-state actors. This renders existing export control regimes, which were designed for traditional armaments, ineffective. The situation is further complicated by the fact that the functional purpose of these systems remains in the shadows. The international discussion is focused on lethal autonomous systems, while the risks associated with the illicit circulation of reconnaissance or engineering robots remain less studied. These robots could be used to prepare terrorist acts, lay mines, or coordinate unlawful armed groups.

The mass production of these systems, their relatively low cost, and the lack of strict accounting and global supply chains present unique opportunities for non-state actors. This renders existing export control regimes for traditional weapons ineffective. This situation is further complicated by the fact that the actual purpose of these systems is often unclear. The international community primarily focuses on lethal autonomous weapons, while the risks of illegal trafficking in intelligence or engineering robots are often ignored. These robots could be used to plan terrorist attacks, mine fields, or coordinate illegal armed groups.

The diversity and variability in the classification of military robots explain why legal regulation in this field consistently lags behind the requirements of the times. Traditional control methods based on the notion of “weapons” and “military equipment” with clearly defined technical characteristics cannot react quickly to changes in global trends. For example, they fail to account for the possibility of repurposing commercial platforms or altering the level of autonomy of existing systems.

Therefore, the absence of a universally accepted and legally significant classification that takes into account the risks of unauthorized proliferation and use based on level of autonomy, base platform, accessibility, and potential harm is not merely a terminological problem but a serious obstacle to global security.

Without a clear understanding of which systems require restrictions and controls at all stages of their life cycle, any regulatory measures will remain incomplete and vulnerable to circumvention through “grey zones”. This underscores the exceptional importance of developing such a classification as a foundation for creating an effective legal mechanism to prevent the illicit circulation of military robotic systems.

III. Legal basis for regulating the turnover of military robots

Currently, international law lacks a single, specialized treaty regulating the circulation of military robots. Instead, there exist scattered norms from various areas of law that only partially, and sometimes indirectly, address certain aspects of the development, transfer, or deployment of such robots. This creates potential opportunities for their illicit trafficking, although the degree of vulnerability of the legal regime remains a subject of debate.

The regulatory foundation rests upon the principles of International Humanitarian Law, in particular the Geneva Conventions of 1949 and their Additional Protocols I and II of 1977 [Sassòli 2019]. Although these instruments do not explicitly mention robots, they apply to all means and methods of warfare, including robotic systems, and impose an obligation to observe the principles of distinction, proportionality, and military necessity when employing them in an armed conflict. There also exists an obligation to assess new weapons, as enshrined in Article 36 of Additional Protocol I¹⁰.

However, IHL possesses a specific characteristic that may limit its ability to directly counter the proliferation of autonomous systems on the black market. This is because IHL is aimed at regulating the application of autonomous systems, rather than controlling their development, production, or cross-border transfer. A more specific, yet still limited, instrument in this field is the Convention on Certain Conventional Weapons (CCW), which was signed in 1981, entered into force two years later, along with its protocols [Cassese 2023:1155-1191]. For instance, Protocol IV on Blinding Laser Weapons established the first precedent for prohibiting a weapon with new, previously unused characteristics. However, it did not ban the further development and stockpiling of such weapons [Egel 2025:720-743].

Since 2014, discussions have continued within the Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS) aimed at understanding the challenges associated with autonomy in armed conflict. Progress within the expert discussions of the CCW States Parties has not resulted in legally binding norms. However, the parties have managed to agree on 11 Guiding Principles regard-

ing LAWS, which establish that: (a) IHL remains applicable; (b) responsibility for the use of LAWS cannot be transferred to machines; (c) progress in the use of AI for peaceful purposes must be taken into account. Although non-binding, these principles represent an important consensus and a foundation for further work. At the same time, a definition of LAWS has not been agreed upon, discussion on prohibitions has not yielded consensus, and the primary focus remains on issues of use rather than on the circulation of technology.

Export control regimes, such as the Wassenaar Arrangement, play an important role, but their effectiveness is often called into question. Although they address certain critically important components of military robots (e.g., sensors, guidance systems, and AI elements), their adaptation to modern realities does not always keep pace with technological development and fails to account for mass-market commercial platforms that are easily modified for military purposes [Sánchez-Cobaleda 2022:77-95]. Furthermore, these regimes are voluntary and focus on interstate transfers, thus failing to account for complex transnational supply chains and the activities of non-state actors, who are the main participants in the illicit market.

United Nations Security Council resolutions imposing arms embargoes on specific conflict zones could potentially also cover military robots. However, in practice, this is not always implemented [Biersteker, Brubaker, Lanz 2022:180-202]. The resolutions lack a clear definition of such systems, and specialists tasked with determining and imposing sanctions for violations in this area may lack sufficient expertise to identify them. Moreover, tracking the supply of small arms, especially in small batches such as unmanned aerial vehicles that can be transported in a private car, can be difficult. This results in resolutions not always effectively preventing the illicit trafficking of military robots.

Thus, the existing system of international treaties and regimes is characterized by fragmentation and incomplete coverage. However, it would be incorrect to assert that it is entirely incapable of addressing new challenges. The arguments of states opposing the immediate introduction of new prohibitions (including Russia) are as follows: (1) premature regulation may stifle innovation in defense; (2) existing IHL norms are sufficient, provided they are correctly

¹⁰ International Committee of the Red Cross. Protocols Additional to the Geneva Conventions of 12 August 1949. 2010. URL: https://www.icrc.org/sites/default/files/external/doc/en/assets/files/other/icrc_002_0321.pdf (accessed date: 16.01.2026).

implemented; (3) the problem lies less with autonomy per se than with the unlawful acts of humans, which should be prosecuted under existing norms; (4) technical and procedural measures (standardization, marking, data sharing) are more effective than new legal prohibitions that are easily circumvented. These arguments warrant serious analysis and cannot be dismissed without evidence. Conversely, proponents of a new treaty point to the following counterarguments: (a) existing regimes do not account for the specific features of autonomy, particularly concerning the allocation of responsibility; (b) voluntary measures and “soft law” are insufficient to deter non-state actors; (c) experience with other types of weapons (cluster munitions, anti-personnel mines) demonstrates that legally binding prohibitions are what change state behavior.

In our view, the most serious problem is the absence of direct international prohibitions on the transfer of certain types of military robots, especially autonomous ones capable of delivering lethal strikes against an adversary, to non-state actors [Rosert, Sauer 2021:4-29]. Furthermore, there are no universal mechanisms for controlling the supply chains of dual-use components and no uniform identification standards. This legal uncertainty and incompleteness not only hinder the detection of unlawful operations but also contribute to the development of the illicit market. Therefore, the development of a new international agreement (or, as a compromise, a protocol to the CCW) appears desirable, although the authors acknowledge that consensus on such an instrument is unlikely in the foreseeable future.

As an alternative or intermediate approach (one shared, in particular, by the Russian Federation), it is proposed to focus on developing: (a) political declarations on principles of responsible behavior; (b) technical standards and verification procedures; (c) confidence-building and transparency measures; (d) harmonization of national legislation in the areas of export control and criminal liability for illicit trafficking. These measures could be implemented more quickly and with greater consensus than a full-fledged treaty. In this article, however, the authors focus on the treaty path, without denying the value of alternative approaches.

A key aspect of a potential treaty (or protocol) should be the unification of terminology [Jönsson 2024]. A legally binding definition of a “military robot” is necessary, one that accounts for its functional purpose and degree of autonomy in making critical decisions. Moreover, categories of systems should be clearly delineated based on the risk of their illicit

proliferation. Without a clear terminological foundation, any subsequent obligations will be vague and difficult to enforce. At the same time, the definition must be sufficiently flexible to avoid becoming obsolete within a few years, yet specific enough to have practical value. One possible solution is to refer to technical annexes that can be updated by a conference of States Parties.

The agreement must be based on clear and unambiguous prohibitions on the transfer of certain types of military robots to non-state structures, including terrorist organizations, unlawful armed groups, and private military companies [Liang 2022:1-24]. Their production, purchase, stockpiling, and use by these structures should also be prohibited. However, control must extend not only to finished systems but also to critical components and dual-use technologies, such as specialized sensors, navigation and targeting systems, artificial intelligence algorithms for autonomous decision-making, and engines of a specified power threshold [Mandle, Pearson 2023: 60-86]. For this purpose, mechanisms for the identification, marking, and tracking of such components in global supply chains need to be developed.

However, the treaty should not be limited solely to imposing prohibitions. It must include the establishment of an effective international mechanism for control, monitoring, and enforcement of the established rules, this being the most complex yet most critical part of the agreement [Silva, Pellens, da Silva 2023]. This implies the creation of a permanent body empowered to collect and analyze data on the circulation of robots, including reports from States Parties on production, export, import, and incidents related to the illicit trafficking of robots and their components. Furthermore, this body should be authorized to conduct investigations of suspicious cases, develop mandatory technical standards for the marking and identification of systems, and facilitate international cooperation, including the exchange of intelligence information and assistance in strengthening national border and customs control capacities.

A key aspect of compliance should be the creation of effective liability mechanisms [Oimann, Salatino 2025:1757-1768]. These mechanisms should include both the international legal responsibility of States for violations of treaty obligations (e.g., for failing to take measures to prevent the illicit movement of robots and their components from their territory) and the obligation for States Parties to criminalize relevant acts in their national legislation and ensure the criminal prosecution of natural and legal persons involved in illicit trafficking.

Despite the complexity of the negotiation process, as evidenced by the protracted discussions within the CCW Group of Governmental Experts on LAWS control, successful existing models such as the Convention on Cluster Munitions or the Arms Trade Treaty (ATT), adapted to the specifics of robotic technologies, could serve as a starting point [Bhaskar, Magoge, Hashimy 2025:222-258]. However, it is important to acknowledge that these models are controversial. For example, the Convention on Cluster Munitions has not been supported by many major military powers (USA, Russia, China). A more realistic analogue might be not a mandatory treaty, but politically binding instruments such as the Ottawa Process on anti-personnel mines, although even that is not universal. The authors recognize that achieving a universal treaty will require significant diplomatic efforts and concessions.

The key distinctive feature of a new treaty should be its ability to stay ahead of its time. It must take into account not only current but also foreseeable technological trends, providing flexible procedures for updating the controlled lists of militarized robots and their components, as well as the criteria for their autonomy and lethality [Sauer 2021:237-250].

The development and adoption of such a targeted treaty is one possible, albeit challenging to achieve, direction. Only a legally binding instrument with a comprehensive mandate, encompassing clear prohibitions, uniform standards, and effective control and enforcement mechanisms, can create a reliable legal barrier against the development of the illicit military robot market. In the absence of such a treaty (which is more likely in the short and medium term), priority should be given to “soft law” measures, technical standards, strengthening national control regimes, and international law enforcement cooperation. Although not ideal, these measures can significantly reduce risks without waiting for an elusive consensus.

Moving from theory to the practical aspects of control, it becomes clear that an effective countermeasure against the illicit trafficking of military robots requires a multi-layered system of interconnected legal mechanisms. This system must be capable of functioning both in the absence of a universal treaty and should such a treaty emerge in the future. National regulatory systems play a key role in this process, and despite their specificities, they must include mandatory certification and licensing procedures for all critical components throughout the entire lifecycle of robots. This applies to all stages, from the development of autonomous targeting algorithms to

the production of specialized sensors and final system assembly.

Special attention should be paid to implementing a legally binding digital product passport system for key dual-use components, such as onboard computers, navigation systems, and engines [Abedi, Saari, Hakola 2024:1-9]. This system should consolidate data on component origin, technical specifications, and chain of custody. This would create a technological basis for end-to-end traceability and significantly complicate document forgery in cases of illicit transactions.

Furthermore, strengthening customs controls is critically necessary. This requires the introduction of specialized inspection protocols, including spectral material analysis, firmware scanning for the presence of uncertified military software, and the creation of distributed databases of component “digital fingerprints”. This would enable the prompt detection of illicit transit attempts, even for smaller systems.

At the international level, beyond the prospect of a new treaty, the urgent modernization of export control regimes such as the Wassenaar Arrangement and the Missile Technology Control Regime (MTCR) is required. Modernization should include the introduction of dynamic lists that are automatically updated based on machine analysis of patents, scientific publications, and tender data. This would allow for the prompt inclusion of new technologies, such as neuromorphic chips for real-time sensor data processing or swarming algorithms, on restrictive lists.

Specific attention should be directed towards financial and cyber monitoring mechanisms [Levi 2022:225-243]. Banks and payment systems should be required to use AI algorithms to detect suspicious transactions related to the procurement of large batches of commercial drones or specific components in high-risk regions for illicit re-export. Furthermore, international platforms for sharing data on cyberattacks targeting military robot developers aimed at stealing source code or hijacking control should be established.

Among procedural and investigative tools, the development of standardized protocols for forensic analysis of incidents involving military robots is of particular importance, including the extraction and verification of digital logs and the reconstruction of algorithmic decision-making processes [Casey, Bollé 2023]. Also playing a crucial role in this context are the harmonization of national criminal liability norms for smuggling, modification, and unauthorized use of such systems, as well as the formation of

joint investigative teams to probe the cross-border chains of illicit trafficking in robots and components for their manufacture.

The key principle underpinning the effectiveness of this complex system is the principle of “mutual reinforcement”. This implies that data from digital marking should be automatically integrated into customs and financial monitoring systems. Information about attempts to circumvent export restrictions should be promptly transmitted to investigative authorities. Results of forensic incident analysis can influence certification standards and cyber defense requirements.

To create a reliable barrier against the illicit trafficking of military robots, it is insufficient merely to establish new prohibitions. It is necessary to create an intelligent control infrastructure that integrates technological advances (digital marking, AI-driven analysis), enhanced procedures (dynamic lists, inspection protocols), and more effective legal instruments (harmonized liability, international investigative mechanisms).

Only such a comprehensive system, operating at the intersection of national and international law, digital security, and operational cooperation, will be able to adapt in a timely manner and stay ahead of the constantly evolving methods used on the shadow market for military robots.

IV. Problems and prospects of development of international legal regulation of illegal trafficking of military robots

Before proceeding to analyze the negative consequences, it is important to note that autonomous military robots carry not only risks but also potential advantages. Proponents of their development point out that such systems may reduce personnel casualties, ensure greater compliance with IHL by eliminating human errors caused by stress or fatigue, enable faster and more effective responses to threats, and operate in environments hazardous to humans. These arguments should not be disregarded when assessing the risks of illicit trafficking. Nevertheless, illicit trafficking exacerbates precisely the negative aspects, thereby nullifying many of the potential benefits.

The uncontrolled proliferation of military robots through illicit channels leads to a number of mutually reinforcing adverse consequences that extend beyond the traditional risks associated with illicit arms trafficking. This creates fundamentally new threats to global security, stability, and the rule of law.

At the operational-tactical level, the most obvious and devastating consequence is the increase in the number of precision strikes against opponents [Plichta, Rossiter 2024:1001-1031]. Non-state actors, such as terrorist groups, organized criminal syndicates, and uncontrolled armed groups, gain access to armed drones and autonomous systems. This enables them to carry out asymmetric attacks with unprecedented accuracy, minimizing risks to perpetrators and reducing the effectiveness of defensive measures. Such technologies not only expand the scale and efficiency of terrorist acts (as demonstrated by the attacks on oil facilities in Saudi Arabia or the use of suicide drones in conflicts worldwide) but also radically alter the nature of urban warfare and the protection of critical infrastructure. Facilities previously considered secure now become vulnerable.

Concurrently, a serious crisis arises in establishing responsibility for resulting harm [Sparrow 2007:62-77]. The autonomy of these systems, particularly in cases of unlawful use, significantly complicates, and sometimes renders impossible, the identification of the specific party responsible for a violation of International Humanitarian Law. The question arises: did the incident result from the deliberate actions of a malicious actor, operator error, an algorithmic malfunction, an external cyberattack, or the unintentional transfer of the system into criminal hands? Such uncertainty jeopardizes the very possibility of accountability, creating a dangerous precedent of impunity and undermining the norms of IHL. States may invoke technical failures or actions by unidentified third parties as a pretext to evade responsibility.

At the strategic level, illicit trafficking in weapons and military equipment can lead to regional destabilization and weaken arms control [Futter 2015]. The widespread emergence of sophisticated military robots among non-state actors or small states lacking professional armed forces may disrupt the existing balance of power, provoke preemptive strikes from both sides of conflicts, and trigger an arms race in robotics and countermeasure technologies. This will divert resources away from sustainable development and increase the risk of escalation, even in local conflicts.

Of particular concern is the illicit trade in technologies, including components for autonomous systems, which allows circumvention of existing non-proliferation regimes for various types of weapons and creates the threat of novel weapons of mass destruction such as, for example, swarms of autonomous drones equipped with chemical or biological agents [Chen, Liu, Guo, Kato 2020:278-283].

The illicit spread of technologies creates new flashpoints and makes conflicts more devastating and unpredictable. The legal consequences of this phenomenon are systemic in nature. The very fact of large-scale illicit trafficking undermines the legitimacy and effectiveness of key branches of international law [Crawford 2013]. The principle of state sovereignty and the duty to ensure security on one's own territory come into conflict with the impossibility of fully controlling rapid technological flows.

The norms governing state responsibility for internationally wrongful acts, as contained in the UN International Law Commission's Draft Articles on Responsibility of States for Internationally Wrongful Acts, are becoming increasingly less applicable in the context of autonomous systems used by non-state actors [Murphy, Rubin 2025:159-172]. In particular, questions arise as to the classification as an "armed attack" of an act of aggression committed by an autonomous robot supplied by an unknown non-state intermediary at the behest of another state. This uncertainty may lead either to the unjustified invocation of the right to self-defense or to inaction in the face of a genuine threat.

Furthermore, the long-term socio-technical and ethical implications of using autonomous systems are linked to a profound transformation in the nature of violence and a lowering of the threshold for its use. The ease of acquiring and deploying military robots reduces the psychological and political costs of instigating conflicts. Broad access to the ability to livestream killings from cameras mounted on autonomous systems, combined with the algorithmic distance between the operator/developer and the victim, leads to a deep dehumanization of war. This lowers moral barriers and simplifies decisions to use force [Von Heinegg, Frau, Singer 2018].

The illicit market, which makes military robotics more accessible, contributes to the "normalization" of robotic violence in public consciousness and in the practice of non-state groups. This creates a vicious cycle: the wider the proliferation, the greater the demand and the opportunities for further development of shadow supply chains, which in turn complicates control over the circulation of military robots. This leads to negative consequences for all humanity, creating a new threat paradigm characterized by heightened danger and management complexity. Within this paradigm, technological complexity, legal uncertainty, and ethical degradation converge.

As stated earlier, combating illicit trafficking in military robots requires a comprehensive approach that is not limited solely to legislative restrictions. It is

essential to create a dynamic system of proactive and enforcement measures, integrating technological, operational, and humanitarian tools to eliminate the threat at all stages of its emergence and realization. A key element of such a system must be the mandatory ethical certification of algorithms. This should include independent auditing of the source code of autonomous systems for built-in mechanisms preventing unauthorized use, the ability to detect attempts at reprogramming, and compliance with IHL norms. It is also critically important to ensure an open architecture framework for non-lethal components. This would enable international inspectors and national regulators to verify the absence of hidden vulnerabilities or functions that could be exploited in illicit trafficking [Ferenc, Dimić, Lutovac, Vidaković, Kvrđić 2013:89-100].

At the operational response level, the establishment of specialized inter-agency "counter-drone defense" centers is of key importance. These centers would combine the capabilities of air defense, electronic warfare, cyber intelligence, and law enforcement. Their task would be to track, intercept, and neutralize unauthorized use of aerial systems in real time using adapted protocols. Particular attention should be paid to "humanitarian intelligence". This entails the systematic collection and analysis of information from non-governmental organizations, journalists, and local communities regarding suspicious movements of components, makeshift drone assembly workshops, or instances of unknown robotic systems being used in conflict zones. Such data must be promptly verified through satellite monitoring and inter-state information exchange channels.

To counter the shadow market, it is necessary to develop algorithms for analyzing blockchain transactions. These algorithms would track anomalous payment patterns for electronics shipments to regions at high risk of re-export. Furthermore, mandatory declaration of ultimate beneficial owners should be introduced for companies producing critical dual-use components.

In the realm of international cooperation, the creation of investigative teams should play a key role. Such teams would be authorized to conduct searches of digital infrastructure, including cloud servers containing telemetry data and industrial equipment exchanges, upon detection of signs of transnational smuggling. It is also necessary to standardize digital forensics protocols for the accurate attribution of incidents [Eichensehr 2019:213-217]. This would include extracting logs from autonomous systems and reconstructing the algorithmic chain of decision-making.

To reduce demand for military robot components on the illicit market, a global campaign should be conducted to enhance technological literacy among non-state actors. This campaign would explain the legal and operational risks associated with using uncontrolled systems, including the risks of hacking and loss of control. Additionally, an international ethical code for robotics developers should be developed. This code would encourage voluntary withdrawal from projects lacking safeguards against unauthorized militarization.

Beyond the foregoing, modern legal regulation in the field of robotics requires the determination of legal liability for the illicit trafficking of military robots. The complexity of this task stems from the pervasive use of modern technologies and the infliction of harm through them, necessitating a revision of traditional legal constructs in the context of a manifold increase in the number of persons capable of committing offenses using modern AI-based systems.

The main problem lies in the fact that existing international and national liability regimes, which were designed for conventional weapons, are ill-suited for situations where an unlawfully transferred autonomous system independently commits wrongful acts. At the level of state responsibility, the principle persists that a state is responsible for acts occurring on its territory. Under the UN International Law Commission's Draft Articles on State Responsibility [Crawford 2002], problems arise in proving effective control over non-state actors that have gained access to robotic systems through shadow channels. It is also difficult to establish the fact of "tacit consent" to such supplies.

To address this problem, the introduction of an obligation to suppress unlawful transfers of militarized robotics technology is proposed. A more promising direction is the development of the concept of "strict liability" [Wendehorst 2020] for harm caused by military robots exported from the territory of the state where they were manufactured.

For natural and legal persons, the harmonization of criminal legislation is crucial. This includes: defining illicit trafficking in critical components (such as sensors and AI modules) as a form of material support to terrorism, even in the absence of evidence of end use; introducing a so-called "duty of care" [Matthews, Greenspan 2020:211-248] for developers, obliging them to implement technical measures preventing the unauthorized military use of their products; and establishing criminal liability for the deliberate disabling of audit and telemetry systems on commercial platforms.

Establishing causation is particularly complex when autonomous systems involving multiple parties are used: the manufacturer (potentially legitimate), the illegal distributor, the operator with questionable legal status, and the algorithm itself. To resolve this problem, it is necessary to develop an international digital forensics protocol. Such a protocol would mandate the preservation of so-called "black boxes" containing detailed decision-making logs and sensor data; establish independent algorithm verification centers for retrospective incident analysis; and recognize digital evidence, such as blockchain records of robot or component transfers and software hashes, as admissible in court.

An innovative tool could be the introduction of "cascading liability", whereby the burden of proving absence of fault is distributed among all participants in the chain. The exporting state would have to demonstrate compliance with re-export control measures; the developer, the presence of built-in safeguards against unauthorized use; and the end-user, the lawful acquisition of the robotic system.

An additional mechanism would be the creation of an international registry of "critical incidents" related to the unlawful use of military robots. This registry would document violations and contribute to the formation of case law. Universal jurisdiction should be recognized for particularly serious crimes such as genocide and crimes against humanity committed using autonomous systems, regardless of the place of commission or the nationality of the perpetrator. To establish an effective liability regime, it is essential not only to develop new norms but also to adapt existing legal constructs to contemporary realities.

V. Conclusion

The conducted analysis demonstrates that the problem of unlawful traffic in military robots, driven by the rapid development of autonomous technologies and the accessibility of dual-use platforms, has evolved into a serious threat to international security and humanitarian stability. At the same time, as shown in the article, a wide range of opinions exists as to the extent to which existing international law addresses this threat and what measures are necessary. The existing international legal framework, which represents a collection of fragmented and outdated norms of international humanitarian law, limited arms control regimes, and inadequate export restrictions, may prove insufficiently effective in countering this threat.

The regulatory crisis manifests in the fact that legal definitions and classifications do not always correspond to contemporary technological realities. Measures aimed at countering non-state actors and the mass market for commercial unmanned aerial vehicles prove inadequate. Traditional legal mechanisms used to determine responsibility cannot always cope with the distributed nature of harm caused by autonomous systems.

Overcoming this crisis requires a comprehensive set of measures at both the international and national levels. One possible avenue is the development of a specialized international treaty or a protocol to the Convention on Certain Conventional Weapons (CCW). Such a treaty could establish universal definitions, as well as introduce strict prohibitions on the transfer of certain classes of systems to non-state actors. Furthermore, it could regulate the use of dual-use components. It would also be desirable to create an effective verification and monitoring mechanism under the direction of an international supervisory body. At the same time, given the lack of consensus on such a treaty, the priority measures for the foreseeable future should include the harmonization of national legislation in the areas of export control and criminal liability, the introduction of digital marking systems and technical standards, the strengthening of international law enforcement cooperation, and

the development of political declarations and codes of conduct.

In addition, a reform of liability institutions is necessary, which may include the harmonization of criminal laws, the establishment of duties for developers, and the recognition of universal jurisdiction for serious crimes. Delay in creating this multi-layered system could lead to irreversible consequences, although the authors acknowledge that technological and political realities make a rapid solution to the problem unlikely. The effectiveness of norms of international humanitarian law may be called into question, the strategic balance may be disrupted, and the concept of war based on the uncontrolled use of robotics may become more widespread.

Only concerted action, encompassing both treaty-based regulation and technologically grounded control measures, as well as enhanced legal mechanisms of collective responsibility, can provide a reliable barrier against this growing threat and preserve the foundations of the international legal order in an era of unprecedented advances in robotics. At the same time, the authors recognize that the ultimate choice between prohibitive and regulatory approaches is a matter of political compromise among states, and this article offers only one possible variant of such a compromise.

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