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The Implications Of The AI Arms Race On International Security And Peace In Light Of Practical Practices And Legal And Ethical Issues

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Abstract:
Recent developments in the field of artificial intelligence (AI) indicate that this emerging technology will inevitably have a transformative impact on military power, strategic competition, and global politics on a broader scale. This will provide more room for nations to engage in an AI arms race in their quest for strategic superiority. This study aims to examine and analyze the implications of the AI arms race on international security and peace, considering the interconnected legal and ethical issues related to military applications of AI. The study explores the motivations behind the AI arms race and its impact on reshaping the dynamics of international military competition, identifies the legal and ethical issues associated with military applications of AI, and examines efforts to regulate the military use of AI in light of the implications of the AI arms race on international security and peace. The study concludes that this race poses a significant challenge to international security and peace given the risks and challenges it presents in the absence of any concrete regulatory mechanism to address the legal and ethical issues associated with the use of AI in the military domain amid intense strategic competition, particularly regarding the development and deployment of autonomous weapons. This necessitates the search for solutions and alternatives to ensure the responsible use, development, and deployment of these technologies.

Keywords: Artificial Intelligence, AI Arms Race Implications, International Security and Peace, Military Competition, Legal and Ethical Issues.

Introduction:

The world is witnessing a massive technological revolution led by artificial intelligence (AI) technologies, which are bringing about fundamental transformations in various fields of life, including the military domain. With the opportunities offered by the Fourth Industrial Revolution for economic advancement and its impact on a country's overall strategic power, there is a growing awareness of the importance of AI applications in shifting the balance of power in the international system. AI is increasingly seen as an enabling tool for power and a key to achieving global dominance, prompting many governments to keep pace with these new changes imposed by AI applications.

As a result, the world today is experiencing what is known as the "global AI arms race," where countries, especially major powers, are striving to develop advanced military AI technologies to enhance their military capabilities and gain a strategic competitive edge. Many innovations and technological developments related to AI are likely to have real impacts on military applications, ranging from tactical battlefield perspectives to the strategic level.

Despite recent advancements in AI suggesting that this emerging technology will inevitably have a transformative impact on military power, strategic competition, and global politics on a broader scale, particularly with major powers aiming to develop advanced military AI technologies, the innovations and technological developments related to AI are expected to have real impacts on military applications from tactical battlefield perspectives to the strategic level.

Consequently, the world is currently experiencing a "global AI arms race." This race poses a significant challenge to international security and peace given the risks and challenges it presents. The rapid development of AI technologies in the military domain represents a clear challenge to existing legal frameworks, extending beyond the principles of international humanitarian law governing the conduct of hostilities to encompass rules of international human rights law, accountability issues, rules of attribution, and a range of other ethical concerns.

Therefore, this study aims to examine and analyze the implications of the AI arms race on international security and peace, considering the impact of AI in reshaping the dynamics of international military competition. The expanding infrastructure of autonomous weapon systems presents a wide range of challenges and risks, particularly in contexts where the applicable legal framework is unclear. This raises humanitarian concerns and poses a threat to international security and peace in light of the interconnected legal and ethical dilemmas associated with the development of AI technologies in the military domain amid intense strategic competition. This necessitates the search for solutions and alternatives to ensure the responsible use, development, and deployment of these technologies.

Axis One: The AI Arms Race: Drivers and Dynamics

Military experts claim that the process of arming with artificial intelligence is happening on a large scale, such that AI can be integrated into all aspects of the armed forces' operations, including its organizational structure, operations, and weaponry. It is expected that AI technologies will affect all five domains of warfare (land, sea, air, outer space, and cyberspace), in addition to areas of command and control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR). This is driven by the promises of improved data analysis, increased efficiency of war systems, and cost reduction (Garcia, 2019). Based on this, countries, especially major ones, are seeking to invest huge resources in the field of military AI, in search of achieving a strategic security advantage (and economic benefits) in a competitive context.

1.AI Arms Race: Drivers and Justifications

The term "AI arms race" refers to the intensification of the development and use of cognitive features in the military domain, such as weapons, defense systems, and military doctrines, amid ongoing competition to develop innovative AI technology for military purposes in a manner similar to the development of nuclear weapons by countries during the Cold War. This is driven by the fear of losing strategic influence over the adversary, given the transformative potential (or military technological revolution) of AI for state security and its strategic calculations (Khaqan, 2023, p.533).

The American Defense Science Board has defined artificial intelligence as computing tasks such as decision-making, perception, and conversation, which humans used to perform exclusively. Therefore, the essence of AI technology is to independently mimic human characteristics (Dahab, 2019, p. 33-34), so that AI systems are designed with human-like capabilities, such as the ability to think, reason, learn from experience, and discern meaning. Although these systems have not yet reached the full level of human intelligence or the ability to feel emotions, their human-like skills are astonishing (Sobon, 2022), considering the operation of AI systems, which have gone through three major versions (symbolic AI, machine learning, and deep learning).

In their quest for strategic superiority, a large number of countries, particularly major powers, have either launched national AI strategies or made AI an integral part of national security policies, driven by three key motives:

First, AI might change the fundamentals on which state power is based (Khaqan, 2023, p. 533-534). Countries such as China, Russia, the USA, and other advanced nations consider AI a critical factor in their future global power. In this context, Russian President Putin stated in 2017 that whoever wins the AI race will rule the world (Sobon, 2022). The cumulative output of AI research has increased by 1300% between 2003 and 2021, with journal publications and conference papers tracked by the OECD AI database using OpenAlex and Scopus data, showing that the total cumulative output of AI research in 2003 was less than one million papers, rising to about 13 million papers in 2021 (Citi GPS, September 2023, p. 44).

Second, it might also change the current balance of power, especially among major powers like the USA and China.

Third, the future prospects of AI in the military domain could modify not only the nature of war but also its essence (Khaqan, 2023, p. 533-534).

2. AI Applications in the Military Field:

Fu believes that a country's technological superiority in AI will quickly become an overwhelming advantage on the battlefield, considering AI's military applications that cover two main dimensions: First, AI can be used to improve the performance of existing and conventional weapon systems. Compared to traditional technology, AI-based weapon systems will have several advantages, such as faster response times, all-weather combat capabilities, strong battlefield survivability, and lower costs. Second, AI can assist in decision-making or facilitate independent decision-making (China Arms Control and Disarmament Association, 2019, p. 20).

Based on the above, AI systems can provide several applications in the military field. At one end of the spectrum, there are the same applications found in the civilian sector, such as logistics, translation, image recognition, navigation, and disease diagnosis. At the other end, there are potential AI-dependent applications unique to the defense sector, such as physical weapon systems or offensive cyber operations and the cyber-physical systems that support them. In the middle of the spectrum, there are a range of AI-driven applications applied to autonomous or predictive tasks that support decision-making and analysis (Paoli et al., 2020, p. 5-6), where generative AI makes a significant qualitative leap in autonomous capabilities. Below are some key areas of AI military applications:

- Weapons and Weapon Systems: Integrating AI into weapons leads to a cognitive shift, achieving an increasing degree of autonomy in every field of weapons, known as autonomous weapons systems or lethal autonomous weapons systems (LAWS). The International Committee has defined them as weapons that select targets and exert force without human intervention after being launched by a person, operating independently in response to information collected by their sensors based on a "target profile" (Comite International de La Croix Rouge, 2021). The use of AI in military industries has led to the development of combat systems with an autonomous nature that often surpass human capabilities, used in battle management, detecting threats, using various weapons, and gathering and analyzing information to serve the military stance of countries.

- Cyberspace: Cyberspace will become the new battlefield for current armies. In this regard, the internet and big data are likely to play a vital role in the 21st century, with most warfare activities conducted through cyberspace.

- AI-Driven Surveillance: The importance of surveillance as a variable in war has significantly increased due to the uncontrolled momentum of technological advancement. In this context, countries are positioned to control information directly or indirectly (Khaqan, 2023, p. 538-539).
AI, as an advanced dual-use technology, has several impacts in the military field, most notably:

-Intelligent situational awareness and information processing on the battlefield and in unmanned military platforms such as some aerial vehicles and remotely controlled vehicles.
-Enhancing a state's electronic offensive and defensive capabilities, with the ability to analyze the source of cyber intrusions, assess the damage to networks, and automatically recover data.

-The military application of artificial intelligence impacts military organization and combat philosophy, with the potential to radically change the nature of future warfare. For example, the combined application of high-precision munitions, unmanned equipment, and networked information systems has led to the emergence of new intelligent combat theories, such as cloud warfare and swarm warfare.

-Improving war prediction effectiveness in at least two ways. The first is calculating and predicting war outcomes more accurately. The second is testing and refining war plans more effectively with the help of AI-integrated war game systems.

-AI-based decision support tools help liberate human capabilities, allowing humans to focus on key decisions and main tasks in future wars.
Despite the aforementioned impacts of AI applications in the military field, according to Fu, "there remains a significant amount of uncertainty regarding the impact of AI on military affairs, both in terms of extent and form." Without a comprehensive understanding of AI military applications, proposed responses could become an "expensive and ineffective new Maginot Line," as the greatest challenge in developing human-machine collaboration technology is ensuring human control at all times (China Arms Control and Disarmament Association, 2019, p. 20).

3. AI and Reshaping the Dynamics of International Military Competition:

Recently, there has been an increasing prominence of military AI applications, which are making a remarkable qualitative leap in autonomous capabilities. This creates an environment where countries strive for technological superiority through national AI strategies as part of their national security policies.

Given the vast potential for innovation and advancement in AI, this technology could contribute to reshaping the dynamics of international military competition, intensifying the arms race between the USA and China, with Russia slightly trailing, and European countries such as the United Kingdom and France further behind. Meanwhile, other countries, like South Korea, are attempting to enter the competition, although their efforts remain limited.

Table No. (01): Leading countries in the arms race using artificial intelligence

Country	Intentions	Citizens' trust in artificial intelligence	Defense Budget (in billions of dollars)	Projected Drone Spending (in billions of dollars) - 2017-	GDP (in trillions of dollars)	Number of artificial intelligence companies	Publications related to artificial intelligence (1997-2017)	Artificial Intelligence Patents and Patent Applications	Artificial intelligence experts	The best artificial intelligence experts
USA	High	25%	649	17.5	19.4	2.028	369.588	133.941: 279.145	28.536	5.158
China	High	70%	250	4.5	12.2	1.011	327.034	55,868: 66,508	18.232	977
Russia	High	40%	61	3.9	1.5	17 *	* * *	* * *	* * *	* * *
European countries	Variety	29%**	281**	8**	17.3**	859**	425.166**	45.521**: 233.050**	41.459**	5,111**
South Korea	High	17%	43	1.9	1.5	26	52.175	69.158: *	2.664 *	* * *

* * *Data is unavailable**. ****Data is only partially available for some EU member states. The numbers are below estimates based on the aggregated data available for all EU countries.

Source : (Denise and Garcia,2019, P.333)
(At the disposal of the reasearcher)

- United States:
For decades, the USA has led in technological innovations, home to tech giants like IBM, Google, Microsoft, and Intel. These companies have heavily invested in emerging technologies, especially AI. The US has invested approximately $1.7 billion in AI-based research and development initiatives. The Department of Defense has issued several documents aiming to integrate AI into vital military areas, including the National AI Strategy, the Strategic Competition Act, the Innovation and Competition Act, and the Joint Artificial Intelligence Center. The US Armed Forces use various AI applications such as autonomous drones, unmanned underwater vehicles, unmanned aerial vehicles, jets, and early threat detection systems. US Defense Secretary Lloyd Austin stated that America will invest in AI-led military applications to counter China's growing military capabilities (Khaqan, 2023, p. 536). The US leads in developing and investing in autonomous devices. By 2010, the US had invested $4 billion in research on lethal autonomous weapons and allocated another $18 billion for autonomy development through 2020. Despite already having more than 20,000 autonomous vehicles, the US spent $17 billion on drones by 2021, including 3,447 new unmanned systems for land, sea, and air (Denise and Garcia, 2019, p. 333).

- China:
The People's Republic of China (PRC), aiming to become a global leader in AI by 2030, is another prominent player in the AI arms race. China has allocated billions of dollars for numerous AI-based research and development projects. In terms of R&D, Chinese AI research publications have surpassed those of Europe and the US, and China has become the leader in facial recognition technology widely deployed for surveillance. China unveiled its Next Generation AI Development Plan in 2017, declaring AI a strategic technology. Consequently, the US and European countries have stated that China's growing AI capabilities pose a threat to national and international security (Khaqan, 2023, p. 536). Chinese investment and funding in AI projects from 2013 to 2018 amounted to 60% of the world's total funding for such projects, more than double that of the US during the same period. With significant investments in "civil-military integration," the Chinese State Council estimates the value of its AI industries to reach $59 billion by 2025 and $150 billion by 2030 (Denise and Garcia, 2019, p. 333). Chinese President Xi Jinping has repeatedly emphasized China's clear commitment to AI dominance, also referring to it as "intelligent warfare." Both the Chinese Communist Party and the People's Liberation Army see AI as crucial for next-generation wars. China is diligently working on twelve significant military AI applications amid intense competition with the US, particularly regarding the semiconductor industry (Khaqan, 2023, p. 537).

- Russia:
Russia views AI as a strategic technology that will shape defense priorities and the balance of power. In 2018, Russia issued its first-ever AI strategy, consisting of ten points, prioritizing big data as the basis for AI development, algorithm analysis, monitoring global AI developments, and organizing an annual AI conference, with the Ministry of Defense tasked with conducting AI-based war games. Russia's critical role in military technology reflects its concerns and aspirations regarding AI, influencing its future behavior. It is unlikely that Russia would abstain from the AI arms race while countries like the US and China prepare to modernize their militaries by integrating autonomous features. Historical precedents indicate a similar arms race with nuclear weapons during the Cold War when the US and the Soviet Union enhanced their nuclear capabilities, increasing the number of nuclear weapons to around seventy thousand within twenty-five years. This led to the adoption of nuclear arms control mechanisms, including treaties like the Non-Proliferation Treaty (NPT) and non-proliferation regimes like the Nuclear Suppliers Group (NSG) (Khaqan, 2023, p. 537).
According to Russia's programs "Creating Future Military Robots by 2025" and "Concept of Deploying Automated Systems for Military Use by 2030," Russia aims for 30% of its combat force to be partially or fully autonomous by 2030, focusing sharply on equipment development in the near term. Despite its lower annual GDP and total defense budget compared to other countries, Russia allocates a rearmament budget of $346 billion, concentrating on military robots, and hosts annual conferences on the use of robots in its armed forces, attempting to match China's expenditure on drones.
However, Russia significantly lacks investment in AI – even basic statistics on AI in Russia are hard to obtain. Despite having at least ten research centers dedicated to AI use in warfare, Russia's annual domestic military AI spending is estimated at only $12.5 million annually, just 0.01% of the US military's non-classified AI budget. International sanctions might be part of the problem, forcing Russia to cut its defense budget by 7% in 2017, 3.2% in 2018, and an estimated 4.8% in 2019 (Denise and Garcia, 2019, p. 334).

- European Countries (e.g., the United Kingdom and France):
In June 2022, the United Kingdom released its official Defense AI Strategy and organized its strategic cohesion by establishing several departments. The Defense AI and Autonomy Unit (DAU) and the Defense AI Center (DAIC) are responsible for managing strategic frameworks related to developing, adopting, and using AI in military domains. On the other hand, France also released its National AI Strategy (SNIA) with a budget of 1.5 billion euros (Khaqan, 2023, p. 537).

- South Korea:
South Korea has the highest concentration of robots globally, with 631 robots per 10,000 workers. South Korea seeks automation to counteract slowing population growth, with the military being a key area under the threat from the north. Despite being under the US security umbrella, South Korea's capability to develop weapons remains high, spending $41 billion on defense annually, primarily directed toward developing fixed and defensive autonomous weapons. The world's first fixed autonomous gun turret, the Samsung SGR-A1, was developed in South Korea in 2006. Additionally, South Korean arms

manufacturer DoDAAM developed the Super Aegis 2, a long-range surveillance and tracking turret capable of independently detecting, tracking, and targeting (Denise and Garcia, 2019, p. 334).
The integration and use of AI in various military fields lead to a new concept termed the "Third Revolution in Military Affairs" (RMA). This concept is seen as a significant shift in military capabilities, akin to the previous revolutions brought about by the introduction of gunpowder and nuclear weapons. While this concept emphasizes the need for military organizations to adapt and develop AI capabilities to maintain a competitive edge in future conflicts, the use of AI in military operations also raises ethical and legal issues, particularly concerning the use of autonomous weapons and the need for human oversight.

Axis Two: Legal and Ethical Issues Related to Military Applications of Artificial Intelligence:
With the emergence of powerful generative AI models like GPT-4 and Stable Diffusion, alongside ongoing advancements in fields such as autonomous weapon systems and reinforcement learning, concerns have heightened regarding granting AI immense capabilities. Since 2018, UN Secretary-General António Guterres has asserted that autonomous weapon systems are politically unacceptable and morally repugnant, calling for their prohibition under international law. In his new 2023 peace plan, the Secretary-General reiterated this call, recommending that countries agree to a legally binding instrument to ban autonomous weapon systems operating without human control or oversight by 2026, which cannot be used in compliance with international humanitarian law. He noted that in the absence of specific multilateral regulations, the design, development, and use of these systems raise humanitarian, legal, security, and ethical concerns and pose a threat to human rights and fundamental freedoms (Abdul Latif, 2024, pp. 751-753). The autonomy itself is not the problem; rather, the real issue lies in delegating critical decisions about human life to non-human systems, presenting a set of interconnected legal and ethical dilemmas that can be summarized in three main issues:

1.**The Legal Nature of Military AI Applications in Terms of Determining Criminal Responsibility for the Use of Autonomous Weapons:**
Weapons classified as autonomous weapon systems are either remotely operated (but assisted by AI) or fully autonomous within a very narrow scope. However, entirely new autonomous weapon systems (unmanned) may eliminate or reduce the human role in the control and decision-making process, aiming to collectively remove humans from the actual battlefield. Disagreement has arisen regarding the legal nature of these systems, with jurisprudence divided into two opinions on the legal nature of AI in terms of determining criminal responsibility for the use of autonomous weapons:

-First Opinion: The traditional view that "AI is among inanimate objects," given that current legislation is unable to accept the idea of recognizing robots with legal personality. Furthermore, the European association supporting the robotic project personality did not endorse the idea of recognizing them as legal entities with a status similar to a natural person.

-Second Opinion: The theory of the human deputy responsible for AI devices. This theory, developed through civil law on robots issued on February 16, 2017, agrees that AI devices are independent devices that interact with and learn from the external environment. These devices are neither inanimate objects nor responsible beings themselves, but the human responsible for AI devices is the deputy, overseer, and guardian. The full responsibility falls on those managing AI devices (robots), not the devices themselves. The European legislator used the term "special transfer of responsibility burden" to backtrack to the theory of the responsible human deputy and adopted the theory known as the "responsible deputy," understanding how full responsibility lies with the manufacturer of the AI device and the responsibility arising from the deputy's failure to manage the risk (Abdul Latif, 2024, pp. 747-748).
As a result of the absence of a binding international text prohibiting or regulating the use of military AI applications, most countries in 2018 emphasized the importance of maintaining human control over military AI applications and the use of force emanating from them within the framework of the 1980 Conventional Weapons Convention meeting (Abdul Latif, 2024, pp. 751-753).

2.**The Extent to Which Traditional Arms Control Agreements Can Govern the Rules of Engagement and Weapons in a Future Dependent on AI:**
Disarmament treaties particularly emerged after World War II and during the Cold War, mandating the prohibition of war and the use of force in international relations as stipulated in the UN Charter, known as the right of armed conflict. Reducing the number of weapons globally is supposed to help lessen the risk of any use of force between states. Recently, the lines between arms prohibition and disarmament treaties have become more blurred. Originally, they arose from merely banning use (e.g., the 1925 Geneva Protocol on gas), but today, agreements increasingly include more comprehensive regulations extending to research, development, storage, and sale of these systems (e.g., the 1993 Chemical Weapons Convention), which is one of those treaties combining elements of disarmament and humanitarian considerations, no longer limited to banning a specific weapon but an entire class of weapons (Geiss, 2015).
The four 1949 Geneva Conventions and their protocols collectively regulate the means and methods of warfare in a way that minimizes the effects of armed conflicts. The 1977 Additional Protocol I addresses the issue of military technological advancement by anticipating the future development of "new means and methods of warfare" and regulating accordingly. As stated by the delegate from Senegal, Mr. Barr, during the negotiations of the Additional Protocol, there was a general concern at the time of drafting its provisions about the potential "obsolescence within a few years due to subsequent changes in risks arising from the development of weapons and methods of combat."
Accordingly, Article 36 of Additional Protocol I states that countries are obligated to assess whether new means and methods comply with international humanitarian law for times of war. Article 36 is often considered a "weapons review" clause.

However, it is important to note that the actual obligation concerns not only weapons but also "new means or methods" of warfare, applying more broadly to include autonomous systems that constitute new means or methods of warfare, even if they are not weapons themselves.

Article 36 of Additional Protocol I stipulates: "In the study, development, acquisition, or adoption of a new weapon, means, or method of warfare, the High Contracting Party is obligated to determine whether its use would be prohibited in some or all circumstances by this Protocol or by any other rule of international law applicable to the High Contracting Party." A precedent for this clause, which is more explicit on the issue of scientific "improvement," can be found in the St. Petersburg Declaration: "The Contracting or Acceding Parties reserve the right to come to an understanding in the future whenever a precise proposal is made in view of the future improvements which science may bring to the armament of troops, to maintain the principles they have established and to harmonize the necessities of war with the laws of humanity" (Stephens & Massingham, 2022, p. 284).

However, this matter remains controversial given two considerations:

- A review of the drafting history of Article 36, including the official records of the diplomatic conference that resulted in the Additional Protocol and the subcommittee on weapons, shows that while there was some discussion on types of weapons, there was very limited debate on autonomy or even automation, meaning that the lawmakers of war did not foresee all the potential impacts of technological advancement despite anticipating it (Stephens & Massingham, 2022, p. 285).
- Whether a weapon that violates Article 36 of the Additional Protocol I is automatically prohibited or requires a specific treaty for that purpose (Geiss, 2015).

3. The Capacity of International Humanitarian Law (IHL) and International Human Rights Law (IHRL) to Regulate and Control the Use of AI-Enhanced Weapons:

The primary legal challenges of autonomous weapons lie in the absence of legal regulation and international rules governing autonomous weapons, raising questions about their legality under IHL and IHRL since their use in combat operations has become a reality. Over the past two decades, thousands of robots have been deployed and used in the wars in Iraq and Afghanistan, mostly to dismantle improvised explosive devices manually. However, since 2007, modified robots capable of carrying and using weapons have been developed and tested by U.S. forces in Iraq (Al-Aliyan, 2022, pp. 406-407).

The legality of any weapon is fundamentally based on its consistency with existing legal rules concerning various issues such as the principles of distinction, proportionality, military necessity, and humanity. These weapons lack the ability to distinguish between combatants and civilians and between military targets and civilian objects, as stipulated in Article 48 of Additional Protocol I of 1977. Additionally, it is necessary to measure the expected harm to civilians before carrying out any attack compared to the military advantage that can be achieved. These weapons would face significant difficulty in assessing military necessity, as it is nearly impossible for them to possess this ability due to its close association with human intellectual and existential capabilities. Their use could also violate human values, especially regarding reliability and uncertainty about the outcomes of their operation in the absence of human supervision, in addition to risks of interference and susceptibility to cyber-attacks, delays in processing algorithms in complex situations, and the challenge of self-learning and AI development after manufacturing, whether through cyberspace or otherwise, followed by self-evaluation and training (Al-Aliyan, 2022, pp. 411-414).

The constraints and standards that can be applied to ban modern weapons under IHL are embodied in the following:

- Excessive Harm or Unjustifiable Suffering Standard: Over time, autonomous weapons may become distinctive and precise in both attack and defense more than humans. Nevertheless, the potential for causing unjustifiable suffering remains, not due to autonomy but due to spontaneity.

- Random Effects Standard: The difficulty lies in using the weapon itself, as it may be used randomly in ways that violate its intended uses, which would constitute a violation of IHL provisions.

- Wide-ranging and Long-lasting Environmental Damage Standard.

- Obligation to Review Weapons: Currently, there are no specific rules regulating these types of weapons. However, Article 36 of Additional Protocol I requires states, when developing or acquiring a new weapon, to conduct studies and tests on the weapon to determine whether its use is prohibited under IHL rules or some of them, and its compliance with binding customary rules that prohibit and restrict the use of weapons. Nevertheless, AI itself is not an independent weapon system but may be part of a weapon system, which may pose an obstacle to achieving this constraint since compliance involves only reviewing weapons. Additionally, states must respect and ensure respect for the Geneva Conventions according to the common Article 1 of these conventions by preparing qualified personnel in the use of these weapons and providing legal advisors to offer advice to their operators (Qasimi, 2023, pp. 212-213).

Axis Three: Efforts to Regulate the Military Use of AI in Light of the Implications of the AI Arms Race on International Peace and Security:

While revolutionary technologies hold many promises for humanity, their use for military purposes can pose risks to international peace and security. UN Secretary-General António Guterres, in his disarmament agenda titled "Securing Our Common Future," emphasized that "arms control has always been driven by the need to address the challenges that science and technology pose to peace and security" and emerging means and methods of warfare (Sisson, Aug 2019, P03). In light of the need to maintain human control over AI-enhanced weapon systems, various international parties and actors have created

multiple paths in an attempt to regulate the military use of AI applications amid the global AI arms race's impact on international peace and security.

1. Implications of the AI Arms Race on International Peace and Security:

As with previous revolutionary technologies, AI applications can affect international peace and security, particularly when integrated into the tools and systems of national armies. After most countries issued their national AI strategies, which are part of their national security policies, this competitive dynamic could lead to security dilemmas. States may individually take measures to enhance their own security, resulting in a net decrease in security for all. An AI arms race may entail several challenges and risks, including:

- Challenges to Arms Control and Non-Proliferation: The AI arms race presents challenges to arms control and non-proliferation efforts in the absence of frameworks and agreements to ensure responsible use and prevent uncontrolled proliferation of AI-driven weapons, which may lead to a race prioritizing technological advantage without considering long-term impacts and ethical concerns. Notably, while "removing emotion from nuclear strategy was ultimately impossible, AI makes it possible, and herein lies its greatest risk" (Garcia, 2019).

- Uncontrolled Development of Autonomous Weapons: The development of AI-driven weapons and defense systems may take an uncontrolled trajectory due to the lack of an international regulatory mechanism, gradually removing humans from the decision-making loop, potentially leading to unintended risks. Moreover, any venture like deploying autonomous weapons to showcase power in a competitive environment would accelerate the AI arms race among major actors.

- Misuse of Cyber Warfare: AI can be used to enhance offensive and defensive capabilities, with AI-driven algorithms potentially being used to disseminate disinformation through sophisticated cyber-attacks to manipulate information in favor of or against a cause.

- Undermining Strategic Stability: The term strategic stability generally refers to "a state in which a country seeks to achieve or maintain strategic superiority to gain strategic leverage over an adversary using nuclear, conventional, cyber, or other unconventional means." In this context, incorporating rapid AI features into weapons and defense systems creates a new strategic culture, increasing the likelihood of undermining strategic stability. As the balance of power shifts, a scenario of intense competition between major powers is likely since warfare revolves around four main elements: weapons, weapon domains, military doctrines, and battles. All these areas are undergoing significant transformation due to AI features, and the absence of a regulatory mechanism for AI systems will undermine strategic stability (Khaqan Ahmad, P.340-341).

The aforementioned challenges and risks can affect international peace and security in three interrelated ways:

- Amplifying Uncertainty and Risks Posed by Existing Threats (in both physical and virtual domains).
- Transforming the Nature and Characteristics of These Threats.
- Introducing New Threats to the Security Landscape (Johnson, 2019, pp. 159-160).

Based on the above, it is evident that the military use of AI has rapidly become a significant potential source of instability and strategic competition. AI may bring substantial changes to military power, affecting the balance of power, driven largely by perceived challenges posed by rising revisionist powers (particularly China and Russia). Increasing competitive pressures in the AI field and the growing complexity of deep learning will have profound tactical and operational impacts, which will have strategic consequences manifesting in several ways: (1) In its current development stage, AI itself has few strategic effects; it is rather a potential force multiplier and an enabler for many high-tech fields, including cyber, autonomy, robotics, and guided missiles; (2) The uncertainties and risks surrounding the proliferation of dual-use AI technology can exacerbate international security in multiple ways: exacerbating existing threats, transforming the nature and characteristics of these threats, and introducing new (and fallible and insecure) threats to the security landscape; (3) The simultaneous pursuit of AI technology by major and emerging powers (especially the U.S. and China) will create additional incentives for strategic competition and mistrust, with profound potential implications for international security (Johnson, 2019, pp. 159-160).

2.International Efforts to Regulate the Military Use of AI:

Since competition in this field is relatively new, the international community has not agreed on governing and regulating rules for its various applications and uses. However, international cooperation and the development of responsible artificial intelligence and ethical frameworks are very important in light of the need for joint efforts to develop guidelines and regulations on the use of artificial intelligence in the military field, which contributes to preventing the risks associated with the arms race and promoting the responsible use of this technology. In this context, different paths have been taken to regulate the arms race with artificial intelligence or at least mitigate its risks, through the following methods:

- Role of Leaders: Since 2015, the growing concerns surrounding autonomous weapons and similar technologies have sparked outcries from prominent figures in society. Stephen Hawking, Elon Musk, Steve Wozniak, and many other leaders in AI and robotics published an open letter condemning the development of autonomous weapon systems. They highlighted that the key question facing humanity today is whether to initiate a global AI arms race or to prevent it. If any major military power proceeds with developing AI weapons, a global arms race is almost inevitable, and the ultimate endpoint of this technological trajectory is clear: autonomous weapons will become the Kalashnikovs of tomorrow.

In response, various alliances and AI research centers have been established to create a unified approach in developing AI-based products, regardless of their application. For example, the International Technology Law Association (ITLA) published a global policy framework titled "Responsible AI," which calls for actions including embedding AI development in human-centered principles such as accountability, making organizations that develop, deploy, or use AI systems responsible for the

damages caused by AI. Additionally, companies like Microsoft and other major AI competitors have come together to promote the idea of responsible AI development (Sobon, 2022).

-Arms Control Agreements: The development of AI-driven weapons necessitates the review and adaptation of existing arms control agreements to encompass these emerging technologies. International efforts should aim to include AI within the frameworks of arms control, considering factors like human control, ethical use, and non-proliferation (Khaqan, 2023, pp. 341-343).

In this context, countries such as France and Germany have called for the development of "potential guidelines" as an ethical code of conduct to encourage the development of autonomous weapons in line with current international law. Furthermore, 28 countries have called for a ban on killer robots, and the Non-Aligned Movement and a group of African countries are seeking to negotiate a new international treaty to limit autonomous killing. The bans on previous weapons, from chemical and biological weapons to landmines and cluster bombs, have been effective political tools that significantly reduced the use of these problematic weapons. China has also expressed a desire to ban the use of lethal autonomous weapons on the battlefield but not their development and production. This stance could serve as a basis for alliance negotiations with the rest of the world and represent a significant step forward in preventive security governance (Denise and Garcia, 2019, p. 335).

-International Cooperation: The trend towards developing and expanding the use of intelligent machines aligns with the contemporary armament strategies of advanced nations aimed at minimizing human involvement in armed conflicts and wars to reduce human losses by using AI technologies as the foundation for building military capabilities.

In this regard, United Nations literature indicates that autonomous weapons raise widespread concerns about the protection of life in war and peace, especially regarding their programmability to comply with the conditions stipulated in international humanitarian law and their responsiveness to life protection standards under international human rights law, given the difficulty of establishing a suitable legal accountability system (Al-Aliyan, 2022, p. 393). This involves establishing a guiding framework for the use and restriction of these dangerous weapons. Principle four states that "accountability for the development, deployment, and use of any emerging weapon systems covered by the Convention on Certain Conventional Weapons should be ensured under applicable international law, including by ensuring that such systems operate within a responsible command and control framework overseen by humans." Accordingly, states bear three responsibilities regarding the development, deployment, and operation of autonomous weapons.

Given the necessity of international cooperation and dialogue to address the challenges posed by the AI arms race, UN Secretary-General António Guterres, during a UN Security Council session on AI held on July 18, 2023, called for global AI governance and the establishment of a set of guiding principles in general, aiming to make AI beneficial for the public good (Abdul Latif, 2024, pp. 750-753).

Generally, despite the issuance of guiding and ethical principles by some countries regarding the military use of AI, there is a lack of the necessary global consensus to implement these principles widely. For example, only the United Kingdom and the United States have adopted specific AI guidelines for the military domain. Meanwhile, Australia, Canada, and France have issued instruments such as ethical principles for the use of AI in defense. Out of 193 countries, only 26 have adopted ethical principles for AI (Khaqan, 2023, pp. 533-534).

Conclusion:

With the advent of artificial intelligence (AI) permeating all fields of life, the military sector stands at the forefront of those experiencing a significant transformation through the use of cognitive solutions and automation to enhance military capabilities and strategies on both tactical and operational levels. Integrating AI into military operations has the potential to enhance intelligence, surveillance, and reconnaissance capabilities, improve command and control systems, and enable the use of autonomous systems.

Conversely, AI is one of the most enabling tools that have dramatically changed the rules of the game, significantly affecting the international balance of power and intensifying strategic competition between nations in their quest for strategic superiority. This also influences military strategy, providing nations with greater room to participate in an AI arms race. The United States has entered a new era of competition with China, with these two nations representing the major global players in the AI arms race, followed by Russia and, at a further distance, European countries like the United Kingdom and France. Other countries, such as South Korea, are also trying to enter the competition. While the U.S. maintains a long-term advantage, leading the way in algorithm design and the development of the next wave of AI technology, it also remains the most attractive destination for young talent and researchers in this field.

These dynamics are expected to impact future military and strategic balance among nations and potentially between nations and non-state entities, leading to a shift in strategic power balances in the international system. AI, which is rapidly becoming a fast track to global dominance in the 21st century, is also quickly emerging as a major potential source of instability and mistrust, given the challenges and risks it poses. This is particularly true in the absence of concrete regulatory mechanisms to address the legal and ethical issues associated with the use of AI in the military field, especially concerning the development and deployment of autonomous weapons. This could undermine international peace and security if it raises safety concerns, accelerates the pace of conflicts, or leads to a loss of human control over means of warfare.

In light of the implications of these challenges and risks, it is crucial for the international community to strive to adopt a set of measures to mitigate the impact of the AI arms race on international security and peace, including but not limited to:

- Establishing common international standards to responsibly regulate the development and deployment of military AI technologies and avoid potential risks to international security and peace.
- Enhancing transparency among nations regarding their military AI development programs.

- Updating international law to address the new challenges posed by AI technologies, including rules on the use of force in armed conflicts.
- Strengthening ethical principles governing the development and use of AI technologies, with a focus on ensuring accountability and responsibility.

Footnotes

The first version of artificial intelligence is often referred to as symbolic AI because it uses symbolic reasoning, which can also be described as "if-then" statements (algorithms) executed by the machine to solve problems. In this case, the machine is only capable of making decisions and solving problems that it has been designed to address, limiting true autonomy and keeping humans in the loop, as all the machine's capabilities and functionalities depend on developer input. The second leap in AI growth was achieved through what is known as machine learning, which automates the algorithm learning process. Instead of relying on human intervention to make corrections or modify the information embedded in the code, algorithms are designed to identify patterns and apply what they have "learned" to create more "if-then" statements. These statements continue to grow and make the system more "intelligent" through user input or by obtaining public data. The third leap in AI was the emergence of what is called deep learning. This process allows AI systems to identify objects and perform complex tasks while continuing to learn from their actions without the previously mentioned human intervention. It works much like the human brain, using large datasets to teach AI what it needs to know. AI is programmed to perform rapid calculations based on consuming large amounts of data, and it improves the accuracy of the calculations it generates over time. See: (Sobon, 2022).

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