AI and Robotic armies in the wars of the future: The New Military Revolution in Combat

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Introduction

"Modern Science has given man motion, but has taken away emotions." This is a quote of Binoy Mukhopaddhay, a Bengali "travel" writer from the 1940s. Nearly 100 years down from that time, now we know the essence of those words. With the increasing evolution and inventions of science, human minds are on a verge to get altered. Robots, Artificial Intelligence (AI), automated machines, and other self-regulated bodies are all the wonders of modern science. If robots subdue human resources, worldly activities will surely gain motions with absence of empathy. War is not only about fighting between two or more forces. Other factors like governments, politics, civilians, peace, human rights, security, economy and so on are oriented with wars. Proper judgement and justifications of all these considerations for waging a war is only possible by human brain. AI and Robots are run solely by programming and certain inputs. In war, these robotic armies won't be able to differentiate between right and wrong, which the human soldiers can. In the future, countries using AI and robotic military forces are sure to gain an upper hand on one another, but the persistent security remains a question. The commentary will enlighten the readers on: needs of combat robots, war tactics and implications of using AI and robots, strategic gains of using robots in war, challenges and risks of involving automated armies, and lastly plans and preparations of different countries in pioneering human less wars.

Needs of Combat Robots

Number of reasons bolster the need of using robotic armies in combat. Albeit, soldiers can be trained to fight wars and ensure peace, it can be said that the use of robots in the battle field is more effective. With that being said, the first reasoning comes as minimizing the losses of

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armed forces of a country. If human soldiers are used in wars, the rate of casualties are likely to be higher than the rate of robotic dysfunctions. A robot is made to suffer heavy destructions, which a human being is vulnerable to.

Secondly, the introduction of AIs in the warfare provides increased accuracy of strikes against enemy positions. It involves perfect intelligence, surveillance and reconnaissance, precisely locating the enemy targets, correct aim of shooting down the adversaries, infliction of higher causalities with less force.

Source: https://the-decoder.com/ai-in-war-how-artificial-intelligence-is-changing-the battlefield/

Another justification offered by the military for combat autonomous systems is the arms race. The development of ever-more-advanced weapons and military hardware is actually a result of military advancement. For instance, the most powerful nations in the world are developing hypersonic weapons that can go past a foe's missile defenses.[2] The individuals working on the

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[2] Prakash Nanda, "Hypersonic Hype? This Is Why US 'Trails' Russia, China & Even North Korea In Hypersonic Missile Development," Latest Asian, Middle-East, EurAsian, Indian News, November 6, 2022, https://eurasiantimes.com/why-is-the-us-still-unable-to-develop-hypersonic-weapons/.

calculations for the anti-missile systems will simply not have time to assess the air situation, make judgments, and issue directives due to the incredibly rapid speed of these targets.

One of the most important objectives is to minimize the number of military members who perish in armed situations. It enables the maintenance of numerical parity with or dominance over the enemy. Less casualties also mean lower costs for the military, from insurance premiums to planning rescue missions, evacuations, and burials of the deceased. Additionally, it takes a lot of money and time to educate professional military personnel, making it exceedingly unprofitable to lose them in hostilities.

War tactics and implications involving AI

Conventional wars are carried out by soldiers using infantry strength, armored tanks, artillery guns, lethal weapons, trench warfare system, installing mine fields, bayonet fighting, making traps on ground, and so other tactics. However, artificial intelligence will bring revolutionary strategic changes in battle grounds. Everything in war would be automated and fight with the opposing forces with the introduction of AI. Few examples of those self-regulated equipment and their tactics in war are highlighted as follows-

Changed Warfare Systems

The introduction of AI will help wars to shift from conventionality to hybrid mode. Use of AI in military operations and wars will decrease the dependency on human capital. When robots alter the human soldiers, the number of errors will also be decreased up to a huge extent. Due to the reliance on AI, activities like reconnaissance, gathering intelligence, use of weapons, surveillance, communication, neutralizing explosives, and so on will be more accurate and efficient. This increased efficiency will result in less maintenance.

Quick Decisions can be taken

Taking timely decision is a crucial factor in war period. Strategic and tactical decisions by the commanders are much needed, which then reach the subordinates in the hierarchy of a force. Commanders will surely be able to take faster decisions by using AI in critical times. Those decisions will not only be faster but also accurate. Many eventualities arise when wars are fought. The mechanized decision making if involved in warfare, will overcome any unforeseen using swift tactics. Any wrong decision by human brain will result in casualties in the battle however, strategic decision making using computerized programming will incur much lesser losses.

Using slaughterbots

Formally known as Lethal Autonomous Weapons Systems (LAWS) are also referred to as slaughterbots[3]. These robots employ AI to locate, choose, and kill targets without the aid of a human. Unmanned military drones that are currently in use can only fire when a remote human operator commands them to. However, a slaughterbot has the ability to engage a target on its own. Drones that can be controlled by humans have long been employed in combat. But when paired with easily accessible image identifiers and self-propelled mechanisms, they can be transformed into murderous machines.[4]

Drones to 'swarm' drones

A swarm is when several drones are used at once, communicate with one another, and alert their operator to changes on the battlefield. Swarms may use a single drone type or a variety.[5] A key frontier in the military applications of AI is the capacity to deploy AI-powered drone swarms to harness this potent collective intelligence for military goals.

Most recent example of swarming drones has been found in Russia-Ukraine war, where in a show of might, Russia sent a swarm of drones into Ukraine, killing at least four people close to Kyiv.[6] Moreover, the US is advancing autonomous drone swarm technologies which have shown effectiveness in the ongoing conflict in the Ukraine and in simulations that demonstrate their decisive impact in South China.[7] Number of other countries have opted for introducing this tactic in warfare, which is eventually discussed in this commentary.

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[3] Nigel Pereira, "Slaughterbots: The Weaponization of AI - Sify," December 15, 2022. https://www.sify.com/ai-analytics/slaughterbots-the-weaponization-of-ai/.

[4] Sayeed Ahmed, "It's AI Powered Slaughterbots, Not ChatGPT, That Should Worry Us," *The Daily Star*, February 22, 2023, https://www.thedailystar.net/opinion/views/news/its-ai-powered-slaughterbots-not-chatgpt-should-worry-us-3254361.

[5] Ryan Bridley and Scott Pastor, "Military Drone Swarms and the Options to Combat Them'" Small Wars Journal, August 19, 2022, https://smallwarsjournal.com/jrnl/art/military-drone-swarms-and-options-combat-them.

[6] bdnews24.com, "Russian Drones Swarm Kyiv in Display of Force as Xi Leaves Moscow," Accessed March 25, 2023, https://bdnews24.com/world/europe/pig277soxh.

[7] Gabriel Honrada, "US Secretly Amassing Killer Drone Swarms to Repel China," Asia Times, February 22, 2023, https://asiatimes.com/2023/02/us-secretly-amassing-killer-drone-swarms-to-repel-china/.

Recognizing the targets

In challenging combat conditions, AI approaches are being developed to improve target recognition precision. With the aid of these methods, military personnel can examine reports, papers, and other information to develop a thorough picture of probable action zones. Furthermore, AI in target identification systems enhances these systems' capacity to locate their targets. For instance, onboard an M1 Abrams tank, the US Army displays AI-based target recognition.[8]

Unmanned vehicles

Target detection and recognition can be completed more quickly by unmanned aerial vehicles (UAV), which process the data obtained from their sensors. This is particularly true when using image processing methods based on artificial intelligence. The attraction of those vehicles is that it surpasses many human limitations in addition to reducing battle casualties. Compared to manned aircraft, UAV will be smaller, faster, and more maneuverable. They will be extremely helpful in maintaining a close eye on enemy activity and relaying information to the command stations. Technically speaking, the UAV idea is workable, which can fit into a reliable operation strategy and satisfy operational requirements.

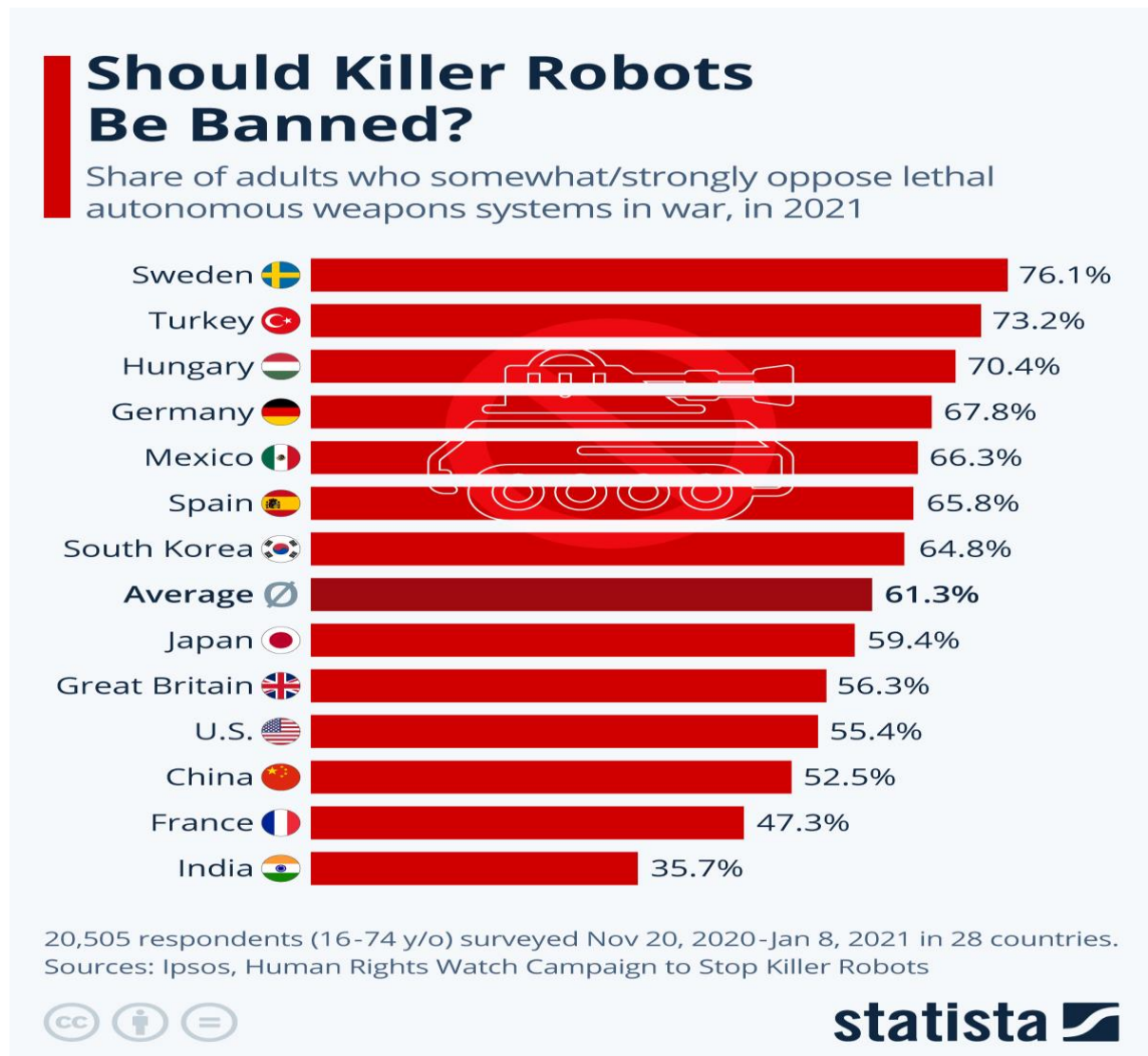**Challenges and risks of developing AI and combat robots**

Robots or AI are not human beings. As previously mentioned, that human combatants are able to understand the ethics of war, but robots only perform through algorithms and are not concerned about ethical principles. Fighting war will be easier by robotic armies, however, there are challenges and risks of involving these forces in real war scenario.

Human rights advocates are alarmed by military technological advancements. When it comes to removing human control from the use of for their use would create a significant accountability gap whereby programmers, manufacturers, and military people could all avoid liability for wrongful fatalities and injuries brought on by completely autonomous weapons.[9] A robot might kill a civilian or even its soldiers if there's a faulty program. The UN is

[8] Rojoef Manuel. "US Army Showcases AI-Based Target Recognition Aboard M1 Abrams Tank." *The Defense Post* (blog), February 17, 2023. https://www.thedefensepost.com/2023/02/17/us-target-recognition-abrams-demonstration/.

[9] Mary Wareham, "Robots Aren't Better Soldiers than Humans | Human Rights Watch," October 26, 2020, https://www.hrw.org/news/2020/10/26/robots-arent-better-soldiers-humans.

requesting a prohibition on the use of combat robots with AI in warfare and bringing up these issues for discussion at its meetings.[10]

Should Killer Robots Be Banned?

Share of adults who somewhat/strongly oppose lethal autonomous weapons systems in war, in 2021

Country	Share
Sweden	76.1%
Turkey	73.2%
Hungary	70.4%
Germany	67.8%
Mexico	66.3%
Spain	65.8%
South Korea	64.8%
Average Ø	**61.3%**
Japan	59.4%
Great Britain	56.3%
U.S.	55.4%
China	52.5%
France	47.3%
India	35.7%

20,505 respondents (16-74 y/o) surveyed Nov 20, 2020-Jan 8, 2021 in 28 countries.
Sources: Ipsos, Human Rights Watch Campaign to Stop Killer Robots

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Most importantly, robots are not driven by emotions, they suffer no pain, they are immune to any chemical or biological weapon. The grounds in a machine-versus-machine conflict would be devoid of people. In a war zone, innocent civilians would be forced to bear the full costs of the fight. It suggests that non-combatants will face greater danger than combatants.[11] Additionally, there is a slight danger of proliferation. AI in conflict is simple to transport and

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[10] Amanda Miller, "UN Addresses Lethal Autonomous Weapons—Aka 'Killer Robots'—Amid Calls for a Treaty," *Air & Space Forces Magazine*, December 14, 2021, https://www.airandspaceforces.com/un-addresses-lethal-autonomous-weapons-aka-killer-robots-amid-calls-for-a-treaty/.

[11] Naveen Joshi, "Is It Ethical To Use Robots In War? What Are The Risks Associated With It?," July 25, 2022, https://www.forbes.com/sites/naveenjoshi/2022/07/25/is-it-ethical-to-use-robots-in-war-what-are-the-risks-associated-with-it/?sh=65e670342d33.

difficult to spot. Additionally, unlike conventional weapons, they do not call for a force. A single individual has the ability to send out a deadly robot horde. Genocide and widespread murder could occur in a matter of seconds. The next generation of nuclear weaponry may be AI and cyber weapons.

Most of the developed countries of the world have already opted for and are conducting trials on the use of AI and robotic armies in war. Not all, but examples of few countries with their initiatives are mentioned below.

Source: https://www.alliedmarketresearch.com/military-robots-market-A13130
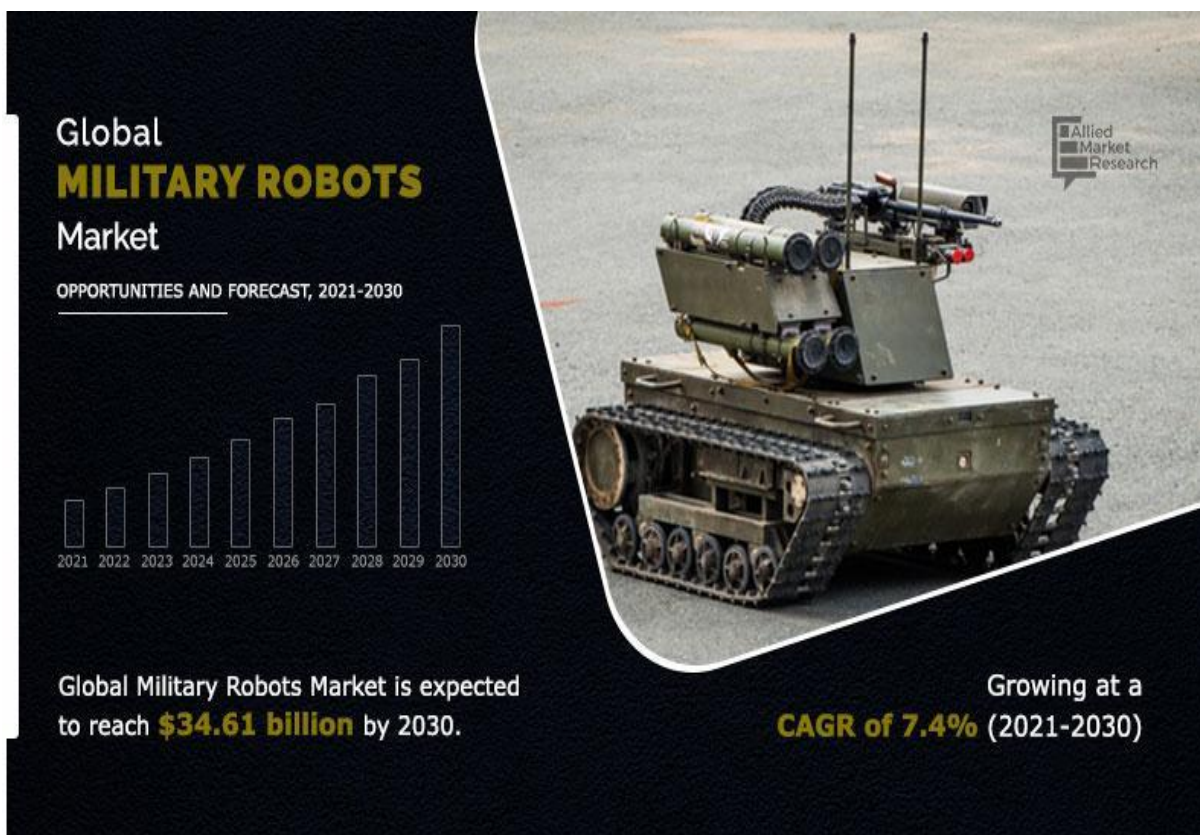
USA

The Pentagon has amended its autonomous weapons policy reflect recent developments in AI, specifically with relation to weaponry.[12] A number of technology advancements have taken place since the policy was first created in 2012, necessitating this update. One of the most advantageous military uses of AI, the update offers recommendations for the safe and moral

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[12] Courtney Albon, "Pentagon Updates Autonomous Weapons Policy to Account for AI Advances," C4ISRNet, January 25, 2023, https://www.c4isrnet.com/artificial-intelligence/2023/01/25/pentagon-updates-autonomous-weapons-policy-to-account-for-ai-advances/.

development and the use of autonomous weaponry. Recently, an update to a Department of Defense Directive confirms the U.S. military's increased dedication to the creation and use of autonomous weapons. The update, which went live on January 25, 2023 is in the first in ten years to concentrate on AI-powered autonomous weaponry.

Netherlands

The Netherlands is the first NATO nation to send armed unmanned ground vehicles (UGVs) into a real-world situation where they will join a military squad and function as a defense force.[13] While some bring heavy automatic machine guns to use in firefights, others are unarmed.

South Korea

In an effort to transition to smaller, more intelligent armed forces equipped with cutting-edge technologies, South Korea has declared about a number of contracts to create and implement homegrown unmanned and robotic systems.[14] In order to control its complete operation as early as 2040, the South Korean Army will begin testing a new combat system in 2024. The country's army termed it as "Army Tiger 4.0" basing on the technological developments in warfare system.[15] Moreover, for military purposes, South Korea and South Africa are integrating their own swarm drones.[16]

China

On October 16, 2022, President Xi Jinping delivered a report at the Communist Party of China's (20th) National Congress. The report's discussion of the People's Liberation Army's (PLA) use of AI was crucial.[17] By the year 2027, China hopes to have completely automated and

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[13] Ciaran Daly, "Killer Autonomous Robot Army Deployed by Major NATO Country in Terrifying World First - Daily Star," October 21, 2022, https://www.dailystar.co.uk/tech/news/killer-autonomous-robot-army-deployed-28297065.

[14] Brian Kim, "South Korea Accelerates Deployment of Unmanned Systems," December 10, 2020, https://www.defensenews.com/global/asia-pacific/2020/12/10/south-korea-accerlates-deployment-of-unmanned-systems/.

[15] Choi Si-young, "Military Unveils Plans for AI-Powered, Agile Army," September 28, 2021, https://www.koreaherald.com/view.php?ud=20210928000842.

[16] Zachary Kallenborn, "Swarm Talk: Understanding Drone Typology," Modern War Institute, December 10, 2021, https://mwi.usma.edu/swarm-talk-understanding-drone-typology/.

[17] Jie Gao, "What the 20th Party Congress Report Tells Us About China's AI Ambitions," November 5, 2022, https://thediplomat.com/2022/11/what-the-20th-party-congress-report-tells-us-about-chinas-ai-ambitions/.

computerized the PLA's military capabilities.[18] China will prioritize C4ISR. (command, control, communications, computers, intelligence, surveillance, and reconnaissance). The Chinese PLA wants to be ready for symmetrical, asymmetrical, and cyberspace conflict. China is also putting effort into creating a swarm drone operational concept for fighting in conflict.[19]

Russia

According to Russian President Vladimir Putin, the nation that leads the globe in artificial intelligence (AI) will be 'the ruler of the world.'[20] To supplement current forces in Ukraine, a significant Russian manufacturer recently revealed plans to create a new combat variant of its reconnaissance robot.[21] The protection of Ukrainian energy installations from other drones is already being done with fully autonomous drones.[22]

Nonetheless, our closest neighbor 'India' has been taking a number of initiatives on developing AI based warfare. One of the examples is the Indian Army is the first major armed force in the world to operationalize high-density swarm drones by the help of New Space Research, a Bengaluru-based start-up.[23]

Conclusion

AI and Robotic armies can be developed in order to aid human combatants, but not replace them. In conclusion, the military's adoption of AI and robotics is a major development in the art of war. The moral and ethical ramifications of using autonomous systems in battle must be taken into account, though. Governments and military groups must make sure that the creation and application of these technologies adhere to moral and legal norms on a global scale.

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[18] Liu Caiyu, "China's Centennial Goal of Building a Modern Military by 2027 in Alignment with National Strength: Experts - Global Times," October 31, 2020. https://www.globaltimes.cn/content/1205238.shtml.

[19] Joseph Trevithick, "China Conducts Test Of Massive Suicide Drone Swarm Launched From A Box On A Truck," The Drive, October 14, 2020, https://www.thedrive.com/the-war-zone/37062/china-conducts-test-of-massive-suicide-drone-swarm-launched-from-a-box-on-a-truck.

[20] Edoardo Maggio, "Putin Believes That Whatever Country Has the Best AI Will Be 'the Ruler of the World,'" Business Insider, September 4, 2017, https://www.businessinsider.com/putin-believes-country-with-best-ai-ruler-of-the-world-2017-9.

[21] Tim Mcmillan, "Russia Wants To Use Robotic Tanks To Combat Advanced Western Armor in Ukraine. It's Likely a Fantasy - The Debrief," January 27, 2023, https://thedebrief.org/russia-wants-to-use-robotic-tank-to-combat-advanced-western-armor-in-ukraine-its-likely-a-fantasy/.

[22] James Dawes, "The War in Ukraine Is Accelerating the Global Drive Toward Killer Robots," February 27, 2023, https://news.yahoo.com/war-ukraine-accelerating-global-drive-110000539.html.

[23] Snehesh Alex Philip, "Army Gets Its First Set of Offensive Swarm Drone System, IAF Next," *ThePrint* (blog), February 13, 2023, https://theprint.in/defence/army-gets-its-first-set-of-offensive-swarm-drone-system-iaf-next/1368508/.

Moreover, to stop the abuse of these technologies, it is also crucial to create efficient regulations and oversight methods. Finally, to address possible risks and challenges and optimize the advantages of AI and robotics in the military, additional research and development are required.