The Impact of Artificial Intelligence on Regional Security, Threat Perceptions and the Middle East WMD-Free Zone

NASSER BIN NASSER

MIDDLE EAST WEAPONS OF MASS DESTRUCTION FREE ZONE SERIES

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About the Author

Nasser bin Nasser is a Senior Adviser to UNIDIR's Middle East WMD-Free Zone project. He is the founder of Ambit Advisory, an NGO focused on security and development issues in the Middle East and the founder of Infosynth, a geopolitical strategic advisory firm. Previously, he headed the Middle East Scientific Institute for Security (MESIS), which aimed to address chemical, biological, radiological and nuclear risks across the Middle East. He also headed the Middle East Regional Secretariat, the first of eight secretariats to become operational under the EU "Centres of Excellence" initiative. Prior to that, he worked in the office of His Majesty King Abdullah II of Jordan, where he last served as senior analyst in the Foreign Affairs Directorate. He holds a master's degree in Near East Studies from Princeton University and bachelor's degree in environmental science and policy and business management from Clark University.

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Note

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Military drone over a war zone at sunset. Credit: Adobe Stock (AI generated).

List of Acronyms and Abbreviations

AI	Artificial Intelligence
GCC	Gulf Cooperation Council
IAEA	International Atomic Energy Agency
IDF	Israeli Defense Forces
ME WMDFZ	Middle East Weapons of Mass Destruction Free Zone
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
OPCW	Organization for the Prohibition of Chemical Weapons
RMA	Revolution in Military Affairs
SIPRI	Stockholm International Peace Research Institute
UAE	United Arab Emirates
UAVs	Uncrewed Aerial Vehicles
WMD	Weapons of Mass Destruction
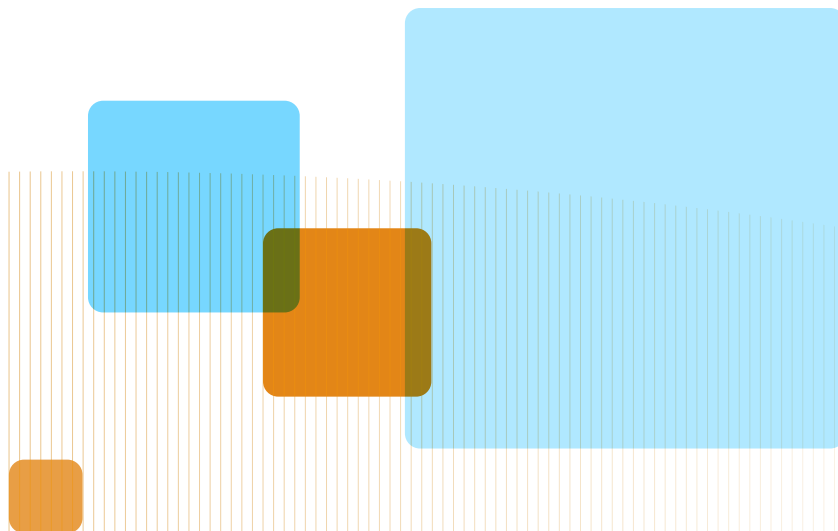
Introduction

There is broad agreement that the state of unipolarity that characterized the post-Cold War period is long over. Some believe that the world has entered a state of multipolarity in which multiple powers are in competition. Others maintain that the world has returned to a state of bipolarity, this time led by the United States and China. In either case, international relations have become characterized by increasing geostrategic competition.

A central expression of that competition has been a technological one in which emerging technologies in general, and artificial intelligence (AI) in particular, figure prominently due to their potential to be a force multiplier in an increasingly digital world. For instance, the threat of weapons of mass destruction (WMD) is no longer only a physical problem, largely separate from cyberspace and the trend toward digitization; rather, it increasingly exhibits digital elements.[1] While it is unclear whether these technologies have been a driver or an outcome of this increased geostrategic competition, what is clear is that it is leading to greater uncertainty and complexity. For instance, if AI and autonomy were to be increasingly incorporated by militaries, especially in relation to nuclear weapons and missile defence, it would create unknown risks

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[1] Natasha E. Bajema, *WMD in the Digital Age: Understanding the Impact of Emerging Technologies* (Center for the Study of Weapons of Mass Destruction, 2018), 6, https://wmdcenter.ndu.edu/Publications/Publication-View/Article/1672667/wmd-in-the-digital-age-understanding-the-impact-of-emerging-technologies/.

Security Council meets on Artificial Intelligence in 2023. Credit: Loey Felipe/UN Photo.

to stability.[2] In a similar fashion, while AI itself is not developing new weapons, new applications and concepts for using such technology do—by accelerating and enhancing research and development, it could contribute to the creation of new types of weapons that were previously not conceptualized, especially biological weapons. These concerns are coupled with the decreasing possibilities of global powers converging on bilateral or multilateral agreements or norms to regulate these technologies.

Emerging and disruptive technologies, such as AI, tend to be most overanalysed and least understood when it comes to their impact on global security. In the case of the Middle East, the problem is even more pronounced as there is little to no assessment of their impact on regional security. This is despite recent cases where such technologies are believed to have been deployed in military and clandestine operations or despite declarations by some countries that they already possess or will develop such capabilities for military purposes. Despite the lack of clear public positions on certain risks or classes of weapons, the analysis and understanding

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[2] Recognizing these risks, states embarked on efforts to reduce AI risks in military domains, for example, the U.S.-China dialogue on AI and individual countries' legislation, political declarations, and guidelines to enhance ethical standards and reduce risk. See Asma Khalid, "Biden and Xi Take a First Step to Limit AI and Nuclear Decisions at Their Last Meeting," *NPR*, 16 November 2024, https://www.npr.org/2024/11/16/nx-s1-5193893/xi-trump-biden-ai-export-controls-tariffs; Vice President Kamala Haris, "Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy," U.S. Department of State, n.d., https://www.state.gov/wp-content/uploads/2023/10/Latest-Version-Political-Declaration-on-Responsible-Military-Use-of-AI-and-Autonomy.pdf; European Commission, "Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence," 21 April 2021, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0206, and "Japan Defense Ministry Rolls out 1st Policy to Promote AI Use," *Kyodo News*, 2 July 2024, https://english.kyodonews.net/news/2024/07/ac20dc12fb98-japan-defense-ministry-rolls-out-1st-policy-to-promote-ai-use.html.

of the possible impact of emerging technologies on national or regional security is still in its infancy. Nonetheless, states may be increasingly forced to develop more concrete positions in the future as the military application of these technologies becomes more visible and widespread and their impact becomes more pronounced.

The distinct characteristics, impacts, and complexities inherent in various emerging and disruptive technologies make it impractical to comprehensively cover all types within the scope of a single report. Instead, this report seeks to explore the potential impact of AI on regional security in terms of regional threat perceptions, WMD, proliferation-related risks, and, by extension, the initiative to establish a WMD-Free Zone in the Middle East (ME WMDFZ).

This report is divided into three sections. Section 1 reviews the current era of strategic competition and illustrates how AI has been affecting global security and stability by driving uncertainty and complexity. The section also considers the current regional context, providing a backdrop against which the impact of AI is explored throughout the report.

Section 2 then analyses the possible impacts of AI on regional security. This includes possible changes in the threat perception of the states of the region and their responses to the increasing adoption of AI, including its military applications. It also covers the impacts of AI on WMD proliferation and arms control processes and on the ME WMDFZ. Given that most Middle Eastern countries do not have a clear public position on this issue or are still assessing or developing one, some deduction, inference, and generalization has been necessary. While this section examines the potential adverse effects of AI on regional security and its potential to curtail the utility of WMD, it also examines the possibility that it could lead to the development of new non-proliferation and disarmament tools.

The last section offers insights and recommendations on how to address the impact of AI on regional security, including opportunities to advance understanding of this impact. Among these are opportunities for awareness-raising and capacity-building activities.

The report aims to promote a better understanding of AI's impact and future role in regional security, WMD risks, and the ME WMDFZ. Its purpose is to contribute to awareness-raising efforts among regional policy and expert communities, hoping to spur national and regional discussions about AI's risks, possible mitigation efforts, and opportunities.

The report is, admittedly, written with a certain degree of technological determinism. In contrast, the role of institutions, actors, finances, and politics will be equally critical in shaping AI's impact on regional security. Relatedly, the discussion about the impact of technology on societies and humanity is not new, and techno-optimists and -pessimists alike can convincingly argue their positions about the merits or downsides of AI. This report attempts to sidestep any such moral determination, leaving it to the reader to reach their own conclusions.

1. The Global and Regional Contexts

Digital map of the Middle East and North Africa. Credit: Adobe Stock (AI generated).

1.1. The global context

It has been widely argued that international relations have entered a new age characterized by increased geostrategic competition. The idea that there are inflection points or different eras in international relations has been contested, with some experts arguing that it is useful only for the purposes of highlighting specific characteristics of one era in contrast to another.[3] Under such a rationale, if the previous age of international relations (for simplification's sake, the globalization era of the post-Cold War period) was defined by increased global cooperation and multilateralism – including on arms control and non-proliferation and a decline in the salience of WMD – the current post-globalization age (starting in or around 2015) is characterized by intensified geostrategic competition and a decline in multilateralism, cooperation, restraints, and norms when it comes to the use, threat of use or development of WMD, especially nuclear weapons.[4] For instance, the United States and the Russian Federation have recently withdrawn from a number of globalization-era arms control treaties.[5] Russia has placed its nuclear

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[3] Ankit Panda, Heather Williams and Aaron Stein, "The End of the Golden Era of Arms Control," War on the Rocks (podcast), 8 February 2024, https://warontherocks.com/2024/02/the-end-of-the-golden-era-of-arms-control/.

[4] Ibid.

[5] Kingston Reif, "Trump to Withdraw U.S. from INF Treaty," *Arms Control Today*, November 2018, https://www.armscontrol.org/act/2018-11/news/trump-withdraw-us-inf-treaty; Mark Trevelyan, "Putin: Russia Suspends Participation in Last Remaining Nuclear Treaty with U.S.," *Reuters*, 21 February 2023, https://www.reuters.com/world/europe/putin-russia-suspends-participation-last-remaining-nuclear- treaty-with-us-2023-02-21/; "Putin Revokes Russia's Ratification of Nuclear Test Ban Treaty," *Al-Jazeera*, 2 November 2023, https://www.aljazeera.com/news/2023/11/2/putin-revokes-russias-ratification-of-nuclear-test-ban-treaty.

weapons on enhanced combat duty, has tested and deployed new delivery vehicles,[6] and has deployed nuclear weapons outside its borders.[7] Australia, the United Kingdom, and the United States have concluded a trilateral security partnership (AUKUS) to deliver a nuclear-powered submarine fleet for Australia..[8] Additionally, China is believed to be rapidly expanding its nuclear arsenal to amass 1,000 nuclear warheads by 2030, up from around 200 in 2019.[9]

A key feature of this era of geostrategic competition is heightened complexity and uncertainty, which is deepened by emerging technologies. For the purposes of this paper, the term "emerging technologies" refers to the technologies of the Fourth Industrial Revolution, which can be described as a "fusion of advances in artificial intelligence, robotics, the Internet of Things (IoT), Web3, blockchain, 3D printing, genetic engineering, quantum computing, and other technologies."[10] Arguably, so far, AI has the greatest impact of these technologies as a result of its multifaceted ability to affect stability and security across multiple strategic and operational levels of warfare and its unparalleled ability to be a force multiplier in an increasingly digital world. This includes AI's intersections with WMD and their proliferation, with cyberweapons and advanced weaponry such as hypersonic missiles, and across operational capabilities such as targeting, command and control, early-warning systems, surveillance, and reconnaissance. The focus of this report is on AI's intersectionality with non-conventional systems (i.e., WMD) and conventional ones that are related to WMD (e.g., ballistic missiles that could carry WMD payloads).[11]

There has been significant conceptual ambiguity, uncertainty, and even sensationalism regarding AI, including "what AI is, what it can do, its perils and promises, and where it is headed."[12] The technology is still developing, and along with it, the understanding of its impacts and opportunities. Some experts claim that the full transformative impact of AI will not be determined until there is an accompanying Revolution in Military Affairs.[13]

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[6] Stockholm International Peace Research Institute, *SIPRI Yearbook 2023: Armaments, Disarmament and International Security* (Oxford: Oxford University Press, 2023), 265–66.

[7] Jack Detsch and Robbie Gramer, "Russia's Nuclear Weapons Are Now in Belarus," *Foreign Policy*, 14 March 2024, https://foreignpolicy.com/2024/03/14/russia-nuclear-weapons-belarus-putin/.

[8] James M. Acton, "Why the AUKUS Submarine Deal is Bad for Non-proliferation—And What to Do About It," *Carnegie Endowment for International Peace*, 21 September 2021, https://carnegieendowment.org/posts/2021/09/why-the-aukus-submarine-deal-is-bad-for-nonproliferationand-what-to-do-about-it?lang=en.

[9] Tong Zhao, "The Real Motives for China's Nuclear Expansion: Beijing Seeks Geopolitical Leverage More Than Military Advantage," *Foreign Affairs*, 3 May 2024, https://www.foreignaffairs.com/china/real-motives-chinas-nuclear-expansion.

[10] Devon McGinnis, "What Is the Fourth Industrial Revolution?," *360 Blog*, 5 July 2023, https://www.salesforce.com/blog/what-is-the-fourth-industrial-revolution-4ir/.

[11] This report does not cover other areas that may have an equally important impact on regional security (e.g., dis- and mis-information or digital forgeries); nor does it cover non-military domains, such as the economic, societal, intelligence and information environment fields.

[12] Wenting He and Alisha Anand, *The 2022 Innovations Dialogue: AI Disruption, Peace and Security*, Conference Report (Geneva: UNIDIR, 2023), 14, https://unidir.org/publication/the-2022-innovations-dialogue-ai-disruption-peace-and-security-conference-report/.

[13] While the underlying assumption is that AI will revolutionize warfare in a manner similar to the way in which chemical and nuclear technology did, some, like Owen Daniels, hold that it will not do so until it leads to a Revolution in Military Affairs. See Owen J. Daniels, *The "AI RMA": The Revolution has not Arrived (Yet)* (NH: Andrew W. Marshal Foundation, 2022), https://www.andrewwmarshallfoundation.org/library/the-ai-rma-the-revolution-has-not-arrived-yet/.

However, some of the negative impacts can be identified, including the following risk areas:

▶ AI could contribute to the development of new kinds of disruptive weapons previously not conceptualized by humans, especially in the areas of biological and cyber weapons.[14]

▶ The potential for increased autonomy of nuclear weapons and advanced weaponry such as hypersonic missiles and missile defence systems could create unknown risks. While governments will always claim that human control over such systems is maintained from a doctrinal perspective, the speed with which automated decisions could take place makes AI-enabled systems the best and fastest means to counter AI attacks, at least in principle.[15] Accordingly, countries may be tempted to increasingly make parts of their weapon systems more autonomous, with potentially destabilizing impacts.

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> **The increased autonomy of existing conventional weapon systems has the potential to transform the future of conflict in unknown ways, including lowering the threshold for states to use force.**

▶ The increased autonomy of existing conventional weapon systems could potentially transform the future of conflict in unpredictable ways, including the possibility that:

▷ Autonomy might lower the threshold for states to use force.[16] Numerous land-, air- and sea-based weapons can already perform surveillance and voice recognition without humans. If given the authority, they may have the potential to track and independently choose to attack targets using AI. Conflict is typically costly for states to wage (financially, politically, and ethically). The increased autonomy and availability of lethal autonomous vehicles and the lower costs of lethal autonomous vehicles, such as uncrewed aerial vehicles (UAVs), compared to a decade ago, could lower the threshold for states to use force. They are also becoming increasingly autonomous, precise, and lethal.[17]

▷ Autonomous systems and systems equipped with autonomous functions could misinterpret intentions. This can increase the risks of accidents and escalatory action since adversaries use a complex system of signalling that an AI system may misinterpret,

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[14] Gregory Nicholas, "The Future of Destruction: Artificial Intelligence," *Journal of the Homeland Defense and Security Information Analysis Center* 2, no. 5 (June 2018): 45, https://hdiac.dtic.mil/articles/the-future-of-destruction-artificial-intelligence/.

[15] Ibid., 46.

[16] See Evanna Hu, "What Does the Future of Autonomous Warfare Look Like? Four Critical Questions, Answered," *Atlantic Council*, 13 May 2022, https://www.atlanticcouncil.org/content-series/automating-the-fight/what-does-the-future-of-autonomous-warfare-look-like-four-critical-questions-answered/, and Anna Greipl, Neil Davison and Georgia Hinds, *Expert Consultation Report on AI and Related Technologies in Military Decision-Making on the Use of Force in Armed Conflicts* (ICRC, 2024), https://www.icrc.org/en/publication/expert-consultation-report-artificial-intelligence-and-related-technologies-military.

[17] Nasser bin Nasser, "Will COVID-19 Hasten the Rise of Lethal Autonomous Weapons?" *Middle East Institute*, 15 September 2020, https://www.mei.edu/publications/will-covid-19-hasten-rise-lethal-autonomous-weapons.

Control panel of the missile defense system. Credit: Adobe Stock (AI generated).

leading to accidental launches or escalatory action. For instance, the combat aircraft of a number of countries fly dangerously close to the military assets of other countries as a warning to signal the possibility of hostile intentions or as a show of force. Military operators and commanders learn to recognize and understand such signals. AI systems, however, may interpret them as hostile action, leading to launches, counter-attacks, and unnecessary escalation that could have been otherwise averted.[18]

▷ Autonomy could impact the characterization and attribution of attacks, especially in the cyber domain. Parties to a conflict—including low-level conflict, competition, or surveillance—have traditionally been able to characterize most actions as hostile (as opposed to a technical malfunction) and attribute them to another party (smoking gun).[19] The increased complexity of attacks by autonomous systems, coupled with AI, could make the characterization of hostile actions and their attribution to their perpetrator even more challenging.

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[18] As an example of how this currently plays out in operations, in July 2023, US officials claimed that a Russian combat aircraft flew close to a US surveillance aircraft over the Syrian Arab Republic, forcing it to go through the turbulent wake and "putting the lives of the four American crew members in danger." The officials added that the incident was a significant escalation in what has been a string of encounters between US and Russian aircraft in Syria in recent weeks, referring to it as a "new level of unsafe behavior that could result in an accident or loss of life." See Tara Copp and Lolita C. Baldor, "Russian Fighter Jet Flies Dangerously Close to US Warplane over Syria," *Associated Press*, 18 July 2023, https://apnews.com/article/syria-russia-us-aircraft-intercept-unsafe-3a88593f3e051286424b2262d18a22af.

[19] There are exceptions, such as chemical and biological attacks whose identification is not immediately possible.

A number of factors reduce the likelihood of limitations on AI being adopted through bilateral or multilateral restrictions or norms. These include the following:

▶ The AI revolution is largely taking place in the private sector and at a speed that makes it challenging for states to regulate on a national level.

▶ AI is inherently dual-use as a "general-purpose" technology.[20] Thus, the associated technology is diffused across multiple sectors. Some experts have claimed that the closest historical analogy to the current moment with AI is the militarization of industrial-age technology.[21]

▶ The technology is not limited to a few states, as was the case with nuclear weapons, which were limited to five states in the mid-1960s when the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) was negotiated. Although the United States and China lead the race for AI and its military applications, it is not confined to them; many other countries, including rising middle powers, have a considerable stake and capacity in the race to develop AI capabilities.

▶ Some countries appear to believe that they might lose out if they do not develop such capabilities, as few alternatives could offer a similar competitive advantage. This perception could contribute to a zero-sum dynamic regarding AI supremacy.[22]

1.2. The regional context

The Middle East continues to suffer from chronic insecurity and instability as a result of ongoing conflict and fragility, outside intervention, and the absence of a regional security architecture. About a decade ago, there was a growing perception that the region's importance was declining due to a US pivot to the Asia-Pacific theatre and the formal conclusion of the US counter-terrorism mission in the Middle East. Despite these assumptions, the region appears to figure centrally in the new age of great power competition because of its vast energy resources, strategic waterways and trade routes, and its significance to global stability and security. Great power competition in the region is intensifying in new domains such as trade and logistics, energy, mining, and telecommunications. However, the competition manifests itself differently from the Cold War era, especially in client–patron relationships.

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[20] General-purpose technologies have a broad range of applications and can be used across various industries and sectors, making them highly versatile, see "Understanding General Purpose Technology (GPT) and Its Impact," *Team Global*, 14 June 2024, https://blog.emb.global/general-purpose-technology-gpt/.

[21] See Paul Scharre and Megan Lamberth, *Artificial Intelligence and Arms Control* (Center for a New American Security, 2022), 16, https://www.cnas.org/publications/reports/artificial-intelligence-and-arms-control. Relatedly, the authors say, "there is a mixed record for regulating novel weapons or military systems throughout history," and a general impression that "an effective weapon that provides 'unprecedented access', to enemy targets and has the capacity to ensure dominance is historically resistant to regulation."

[22] Lizka Vaintrob, "The State of AI in Different Countries — An Overview," *BlueDot Impact*, 15 August 2023, https://aisafetyfundamentals.com/blog/state-of-ai-in-different-countries/.

As a result of the great power competition, many states have been adopting strategic neutrality and enjoy strong commercial, economic, and political relationships with multiple powers simultaneously; for the most part, they do not wholly align with one power. For better or worse, there are even signs that states of the Middle East are taking it upon themselves to reach diplomatic understandings on security issues or pursue security partnerships or arrangements independently of outside powers. The case of the Saudi Arabian–Iranian détente and the growing security relationships between a number of member states of the Gulf Cooperation Council (GCC) and Israel are good examples. In the former case, Saudi Arabia sought to de-escalate tensions with the Islamic Republic of Iran by pursuing dialogue and confidence-building measures.[23] In the latter case, the Israel–GCC security relations developed in response to growing alignment on the perceived threat posed by Iran and shared concerns about the reliability of the United States as a security partner.[24]

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[23] Although China played a convening role in the formal agreement, there is a strong impression that the effort was largely regionally driven or, at least, regionally initiated. See [Saudi Arabia: We hope to continue dialogue with Iran to promote regional peace], *Alarabyia*, 14 March 2023, (in Arabic), https://www.alarabiya.net/saudi-today/2023/03/14/السعودية-نأمل-باستمرار-الحوار-مع-ايران-لتعزيز-السلم-الاقليمي-.

[24] Reportedly, concerns with the reliability of the United States as a security partner may also have motivated Saudi Arabia to pursue the détente with Iran after the United States did not respond to Iranian attacks on Saudi oil facilities in 2019. The Iranian side may have also been encouraged to pursue détente with the GCC, given that its targeting of the GCC inadvertently encouraged greater GCC–Israeli security cooperation. See Saeid Golkar and Kasra Aarabi, "The Real Motivation Behind Iran's Deal With Saudi Arabia," *Foreign Policy*, 6 April 2023, https://foreignpolicy.com/2023/04/06/iran-saudi-arabia-deal-agreement-china-meeting-beijing/; Abdolrasool Divsallar and Hesham Alghannam, "The Strategic Calculus behind the Saudi-Iranian Agreement," *The Cairo Review*, 9 April 2023, https://www.thecairoreview.com/essays/the-strategic-calculus-behind-the-saudi-iranian-agreement/.

Despite these promising signs that Middle Eastern states could pursue their own efforts to stabilize the region, there are still areas where progress has stalled or has even reversed. The ongoing war between Hamas and Israel and the risk of escalation and regional war increased significantly after the attack of 7 October 2023, and with direct military engagements between Israel and Iran. Discussions on the ME WMDFZ are at a crossroads, and its future is unknown. Israel has not attended any of the five sessions convened so far of the United Nations General Assembly-mandated process known officially as the "Conference on the Establishment of a Middle East Zone Free of Nuclear Weapons and Other Weapons of Mass Destruction." Despite Israel's absence, some progress has been made: the participating states[25] have agreed on procedural issues, and some substantive discussions have taken place, including discussions on elements of a possible treaty (i.e., obligations and verification). At some point, participating states will need to decide whether to move forward with negotiations and treaty deliberation without Israel or wait until it joins the process, which currently seems unlikely. Additionally, it is important to note that it is unclear what impact the Hamas attacks of 7 October 2023 or Israel's subsequent military campaign will have on the process or progress towards the ME WMDFZ in general: whether it will make it more difficult or will add a sense of urgency to it. In addition, prospects of a return to the Joint Comprehensive Plan of Action (JCPOA) on Iran's nuclear programme are slim following the US withdrawal from the agreement during the administration of President Donald Trump. Furthermore, mirroring the erosion of international norms around nuclear weapons in this era of international relations, on more than one occasion, an Israeli official did not discount the possibility of using nuclear weapons in Gaza,[26] and some Iranian officials and experts repeated claims that Iran reached a nuclear threshold status.[27]

Few Middle Eastern states have publicly voiced concern about the impact of AI on regional security and stability, although it will undoubtedly have a significant impact on their threat perceptions. There have been several instances where countries in the region are believed to have used AI in a military context and also in military operations or have publicly declared their intention to incorporate AI into their military systems. Israel was the first country in the region to reveal that it has deployed fully automated vehicles to patrol its border and shared plans that

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[25] The current working definition of the geographical delineation of the Zone includes the 22 members of the League of Arab States, Iran and Israel. *IAEA General Conference*, "Modalities of Application of Agency Safeguards in the Middle East," 29 August 1989, https://www.iaea.org/sites/default/files/gc/gc33-887_en.pdf.

[26] Michael Bachner, "Far-Right Minister Says Nuking Gaza an Option, PM Suspends Him from Cabinet Meetings," *Times of Israel*, 5 November 2023, https://www.timesofisrael.com/far-right-minister-says-nuking-gaza-an-option-pm-suspends-him-from-cabinet-meetings/; Sam Sokol, "Far-Right Minister Eliyahu: 'Even in the Hague They Know my Position," *Times of Israel*, 24 January 2024, https://www.timesofisrael.com/liveblog_entry/far-right-minister-eliyahu-even-in-the-hague-they-know-my-position/. The Prime Minister, Benjamin Netanyahu, and the Israeli Government have unequivocally repudiated those remarks, characterizing them as "not based in reality," and the minster was reprimanded. See Nicolas Camut, "Israel Minister Suspended after Calling Nuking Gaza an Option," *Politico*, 5 November 2023, https://www.politico.eu/article/israel-minister-amichai-eliyahu-suspend-benjamin-netanyahu-nuclear-bomb-gaza-hamas-war/.

[27] See [The Possibility of Reconsidering Iran's Nuclear Policies: A New Opinion of the Commander of the Nuclear Protection and Security Corps], *Khabar Online*, 19 April 2024 (in Persian), https://www.khabaronline.ir/news/1896736/ببینید-احتمال-تجدید-نظر-در-سیاست-های-هسته-ای-ایران-نظر-جدید.

The Merkava Mk. 4 Barak, an Israeli-produced tank, in which AI was involved in the design and production.
Credit: IDF Spokesperson's Unit / Wikimedia Israel.

it would deploy weapons on these vehicles.[28] It is also believed to be the first country in the region to have used AI in military operations; Israeli military officials claim to have used AI in "Operation Guardian of the Walls" in Gaza in 2021,[29] and it is reported to have used AI systems such as "Habsora" and "Lavender" to cross-reference existing intelligence sources to identify patterns, verify information, and draw conclusions for decision-making during its current military campaign in Gaza.[30] Israel reportedly also used a remote-controlled AI-assisted weapon system in the assassination of an Iranian scientist in 2020.[31] For its part, Iran has shown interest in using AI to conduct swarm tactics with its UAV fleets and integrated air defence system and has reportedly conducted limited testing of these capabilities in its drills.[32] Saudi Arabia and the

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[28] James Rogers, "Robot patrol: Israeli Army to deploy autonomous vehicles on Gaza border," *Fox News*, 1 September 2016, https://www.foxnews.com/tech/robot-patrol-israeli-army-to-deploy-autonomous-vehicles-on-gaza-border.

[29] Anna Ahronheim, "Israel's Operation against Hamas was the World's First AI War," *Jerusalem Post*, 27 May 2021, https://www.jpost.com/arab-israeli-conflict/gaza-news/guardian-of-the-walls-the-first-ai-war-669371.

[30] "The IDF's Use of Data Technologies in Intelligence Processing," *IDF*, 18 June 2024, https://www.idf.il/en/mini-sites/idf-press-releases-israel-at-war/june-24-pr/the-idf-s-use-of-data-technologies-in-intelligence-processing/; Tal Mimran et al., "Israel–Hamas 2024 Symposium – Beyond the Headlines: Combat Deployment of Military AI-Based Systems by the IDF," *Lieber Institute*, 2 February 2024, https://lieber.westpoint.edu/beyond-headlines-combat-deployment-military-ai-based-systems-idf/; Ishaan Tharoor, "Israel Offers a Glimpse into the Terrifying World of Military AI," *Washington Post*, 5 April 2024, https://www.washingtonpost.com/world/2024/04/05/israel-idf-lavender-ai-militarytarget/.

[31] Ronen Bergman and Farnaz Fassihi, "The Scientist and the A.I.-Assisted, Remote-Control Killing Machine," *New York Times*, 18 September 2021, https://www.nytimes.com/2021/09/18/world/middleeast/iran-nuclear-fakhrizadeh-assassination-israel.html.

[32] "IRGC Drones Capable of Targeting Far Away Vessels with AI," *NourNews*, 10 April 2023, https://nournews.ir/en/news/152384/IRGC-drones-capable-of-targeting-far-away-vessels-with-AI; Hadi Rezaie, [Utilization of Artificial Intelligence in Defence Command System], *Mehr News*, 13 October 2021, (in Persian), https://shorturl.at/vPyBV.

United Arab Emirates (UAE) have already unveiled several domestically produced autonomous and AI-enabled vehicles and UAVs, such as those unveiled at the 2024 Riyadh World Defense Show and the 2023 Abu Dhabi International Defence Exhibition and Conference (IDEX).[33]

Various applications of AI, including for military purposes, are found throughout the region, ranging from those with defensive purposes, such as in air defence systems, via those seeking to enhance situational awareness and command and control to those with offensive purposes, such as use in the targeting life cycle. While some are considered AI systems, others are merely autonomous – although the terms are sometimes used interchangeably, they are two distinct concepts. Autonomy refers to a system's ability to perform tasks with varying degrees of independence without direct human control. This means that the system can execute actions based on pre-set rules or conditions without requiring ongoing human input. Conversely, AI enables machines to achieve a more complex level of autonomy by allowing them to respond dynamically to changing environments.[34] While AI can enhance an autonomous system by enabling it to make more sophisticated decisions, a system can be autonomous without using AI, operating solely on pre-programmed instructions.[35]

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> While these AI systems and advances are changing the nature of conflict, they have not yet led to changes in the military doctrines of regional states. Nonetheless, the absence of official statements does not mean that regional officials are not concerned about them or taking them into their calculus.

While these systems and advances in AI are changing the nature of conflict, they have not yet led to changes in the military doctrines of states in the Middle East, and there has yet to be a discernible reaction to these uses from other countries in the region. Nonetheless, the absence of official statements does not mean that officials of Middle Eastern countries are not concerned about them or are not taking them into their calculus. The international and regional contexts suggest that it is likely that states of the region will increasingly be forced to contend with the growing adoption of AI in military systems, as the application of these technologies becomes more visible and widespread or as they lead to changes in military doctrines.

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[33] See "Huge Draw for Saudi Made Lucid EV, Equipped with Drone and AI, at Riyadh World Defense Show," *Saudi Gazette*, 4 February 2024, https://saudigazette.com.sa/article/640159; [Saudi Interior Ministry Launches Smart Technologies at the World Defense Show], *Al-Sharq Al-Awsat*, 5 February 2024, (in Arabic), «الداخلية» السعودية تطلق تقنيات حديثة ذكية في «معرض الدفاع العالمي», and "EDGE Launches 11 New Breakthrough Autonomous and Unmanned Solutions at IDEX 2023," *EDGE*, 19 February 2023, https://edgegroup.ae/news/edge-launches-11-new-breakthrough-autonomous-and-unmanned-solutions-idex-2023.

[34] Allyson I. Hauptman, et al., "Understanding the influence of AI autonomy on AI explainability levels in human-AI teams using a mixed methods approach," *Cognition, Technology & Work* 26 (May 2024), https://link.springer.com/article/10.1007/s10111-024-00765-7.

[35] "What's the difference between AI and regular computing?" *The Royal Institution*, 12 December 2023, https://www.rigb.org/explore-science/explore/blog/whats-difference-between-ai-and-regular-computing.

Close-up on an abstract design of a display warning of a cyber attack. Credit: Richard Blech / Flickr.

2. The Regional Impact of Evolving Threat Perceptions

The impact of the increased spread of AI and its incorporation into military systems in the Middle East is still ongoing. Therefore, any projection regarding the regional reaction or perception needs to be approached with some degree of caution. Having said this, some scenarios and assumptions concerning evolving regional threat perceptions can be inferred across a number of areas.

2.1. Fuelling insecurity and an arms race, creating further regional imbalances

Due to the ongoing hostilities, instability, mistrust, and insecurity in the Middle East, along with the involvement of outside actors, the widespread application of AI in military operations is likely to further fuel insecurity in the region. This, in turn, can lead to additional arms races or arms race dynamics.[36]

The region has had a long history of conventional and non-conventional arms races, with states attempting to gain an advantage over one another, whether rivals or enemies, or to avoid falling behind. This has often led to excessive and destabilizing arms build-ups.[37] This dynamic

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[36] Jeremy Julian Sarkin and Saba Sotoudehfar, "Artificial Intelligence and Arms Races in the Middle East: The Evolution of Technology and its Implications for Regional and International Security," *Defense & Security Analysis* 40, no. 1 (January 2024): 108-109, https://doi.org/10.1080/14751798.2024.2302699.

[37] Michael T. Klare, *Assessing the Dangers: Emerging Military Technologies and Nuclear (In)Stability* (Arms Control Association, 2023), 25, https://www.armscontrol.org/sites/default/files/files/Reports/ACA_Report_EmergingTech_digital_0.pdf.

has been fuelled by outside actors, including all permanent United Nations Security Council members and major European countries, which view the Middle East as a lucrative market for their arms and military technologies. According to the SIPRI Arms Transfers Database, seven of the top 25 arms-importing states in the world during the period 2017-2021 were Middle Eastern states,[38] with the majority of the imported arms coming from these outside actors.[39]

It is highly likely that a similar arms race in the area of AI military applications would take place in the Middle East because many of the region's states want to gain a competitive advantage over others or do not want to fall behind them. Similar to how previous conventional and non-conventional arms races led to the acquisition by states of WMD capabilities or advanced weaponry, a majority of states would likely seek to acquire AI military capabilities from outside powers. In contrast, other states with more developed domestic defence industries may seek to develop capabilities indigenously. There are two major differences between such a potential arms race and past arms races.

First, there are lower barriers – including technical, industrial, and financial – to developing military applications of AI domestically compared to most non-conventional and some conventional systems. For example, the barriers to the domestic development of AI-enabled drones are lower than those to the development of a nuclear warhead because of the potential availability of the software or the relative ease with which it could be developed. Similarly, the barriers to developing such drones domestically may be easier to overcome than those related to domestically developing advanced ballistic missiles. Moreover, a country would arguably require a more mature industrial-defence base to develop a nuclear warhead or an advanced ballistic missile than it would to develop an AI-enabled drone. This would enable it to effectively take a "quantum leap in the digital age" when it came to developing new capabilities.[40]

Second, as it currently stands, and given the absence of agreement among great powers on restrictions on developing military applications for AI, there may be fewer restrictions on what technologies and systems might be transferred to states in the Middle East. In the case of WMD, for example, international treaties and arms control regimes have largely prohibited the international transfer of material and related know-how. That is not the case with AI as there is no agreement among states to limit or regulate AI, let alone control its transfer to other states,

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[38] The seven states are Egypt, Iraq, Israel, Qatar, Saudi Arabia, Türkiye and the UAE. See Lauriane Héau and Giovanna Maletta, "Arms Transfer and SALW Controls in the Middle East and North Africa: Challenges and State of Play," *Stockholm International Peace Research Institute*, 1 November 2022, https://www.sipri.org/commentary/topical-backgrounder/2022/arms-transfer-and-salw-controls-middle-east-and-north-africa-challenges-and-state-play. Of note, SIPRI's Arms Transfer database defines the Middle East as Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, North Yemen (−1990), South Yemen (−1990), Yemen. See "Regional coverage," Stockholm International Peace Research Institute, last accessed 23 December 2024, https://www.sipri.org/databases/regional-coverage.

[39] For details, see Pieter D. Wezeman, Justine Gadon and Siemon T. Wezeman, *Trends in International Arms Transfers, 2022* (Stockholm International Peace Research Institute, 2023), https://doi.org/10.55163/CPNS8443.

[40] Can Kasapoglu, "Unexpected Pioneer: The Middle East's Burgeoning AI Defence Industry," in *Liberty's Doom? Artificial Intelligence in Middle Eastern Security*, ed. Justine Leïla Belaïd (European Institute of the Mediterranean, 2022), 61, https://www.euromesco.net/publication/libertys-doom-artificial-intelligence-in-middle-eastern-security/. The authors also emphasize, "put simply, less industrialised nations have an opportunity to catch up with the rest".

nor is there any international organization tasked with governing the spread and adoption of AI-military-related technologies in the way that the International Atomic Energy Agency (IAEA) regulates nuclear technology.[41]

A number of studies claim that half of all arms races result in conflict or wars.[42] This is not to say that an AI arms race in the Middle East will inevitably lead to conflict, but rather to suggest that the desire of states to achieve an advantage over others or maintain parity with them will increase the risk of conflict or at least further fuel insecurity in the region. An AI arms race may also lead to further imbalances in the Middle East between those possessing such capabilities and those who do not. This could lead the latter to resort to strategies of asymmetrical warfare that depend on non-state actors and cyberattacks or a combination of both.

Depending on the trajectory of AI military applications and their availability, non-state actors could employ some AI-enabled capabilities (e.g., relatively cheap AI-enabled UAVs) in order to compete with their adversaries' more sophisticated military equipment because they can, to some extent, match the capabilities of states.[43] The intersection of the threat posed by cyberattacks and non-state actors is particularly amplified in an increasingly digital, AI-integrated world because critical infrastructure and defence systems present new cybersecurity vulnerabilities. AI tools can enable cyberattacks and make them more lethal and damaging.[44] In such a case, malicious actors, including

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> The desire of states to achieve an advantage over others or maintain parity with them will increase the risk of conflict or at least further fuel insecurity in the region.

state-sponsored hackers and terrorist organizations, could exploit AI algorithms to optimize their plans to attack or infiltrate critical infrastructure such as nuclear facilities or undermine biosecurity at a laboratory. Such optimization could include intelligence and reconnaissance, identification of vulnerabilities, and enhancing the complexity and effectiveness of attack vectors, such as phishing emails and social engineering, disrupting command and control systems, or launching cyberattacks targeting civilian critical infrastructure. As some experts have shown, AI systems can make it easier for malicious actors to develop more virulent and disruptive malware by automating the detection and exploitation of vulnerabilities, including

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[41] Simon Chesterman, "Weapons of Mass Disruption: Artificial Intelligence and International Law," *Cambridge International Law Journal* 10, no. 2 (December 2021): 182-183, https://doi.org/10.4337/cilj.2021.02.02.

[42] Sarkin and Sotoudehfar, "Artificial intelligence and Arms Races in the Middle East," 97.

[43] Ibid., 108.

[44] Some security risks in AI systems are new. These security vulnerabilities are due to AI's inherent and unique characteristics models. See Ioana Puscas, *AI and International Security: Understanding the Risks and Paving the Path for Confidence-Building Measures* (Geneva: UNIDIR, 2023), 29, https://unidir.org/publication/ai-and-international-security-understanding-the-risks-and-paving-the-path-for-confidence-building-measures/.

through phishing, ransomware, and novel zero-day exploits that target command and control.[45] Regional imbalances caused by some countries' adoption of AI could make cyber- and AI-enabled attacks the main feature of asymmetrical warfare in the future, attacks that could have greater scale and enhanced speed, effectiveness, and sophistication. There is a general impression from industry experts that, in the short term, AI will enhance offensive rather than defensive capabilities.[46]

One major unknown is how AI will augment conventional long-range precision munitions such as ballistic missiles and the development of advanced versions (e.g., hypersonic missiles) and, in turn, affect regional security. It is largely believed that making such weapons more intelligent, autonomous, precise, and fast makes them more destabilizing. Hypersonic missiles – the trajectory of which is not a simple ballistic flight and which can, in theory, change course during flight – already challenge and undermine traditional concepts of deterrence and related capabilities such as early-warning systems and missile defence. Augmenting these weapons with AI poses additional challenges, including:

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> An arms race in this area [AI] may also lead to further imbalances in the region between those who enjoy such capabilities and those who do not, leading the latter to resort to strategies of asymmetrical warfare that depend on non-state actors and cyberattacks or a combination of both.

1. Destination ambiguity: if an early-warning system were to detect the launch of a hypersonic missile, the destination country would be unclear because AI systems could change the trajectory of the flight multiple times.[47]

2. Target ambiguity: even if the destination country became clear, the target could be unclear for the same reasons.[48]

States may perceive these advances as a new threat to their missile defences, their forces' survivability, or their retaliatory capabilities, leading to a further arms race and destabilization.

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[45] Mariarosaria Taddeo, Tom McCutcheon and Luciano Floridi, "Trusting Artificial Intelligence in Cybersecurity is a Double-Edged Sword," *Nature Machine Intelligence*, no. 1 (November 2019): 557–560, https://ora.ox.ac.uk/objects/uuid:8188813d-138e-409d-8686-d2d7d5fa0879.

[46] For illustrative purposes, in a poll conducted in late 2023 by the World Economic Forum, 55.9 per cent of industry leaders believed that in the next two years, AI would provide a cyber advantage to attackers rather than defenders, while 35.1 per cent said that it would remain balanced; only 8.9 per cent said that it would provide an advantage to defenders. See Gretchen Bueermann and Michael Rohrs, *Global Cybersecurity Outlook 2024: Insight Report* (World Economic Forum, Accenture, 2024), 6, https://www.weforum.org/publications/global-cybersecurity-outlook-2024/.

[47] James S. Johnson, "Artificial Intelligence: A Threat to Strategic Stability," *Strategic Studies Quarterly* 14, no. 1, (2020): 26 https://www.jstor.org/stable/26891882.

[48] Ibid.

International Defense Exhibition and Conference 2023, Abu Dhabi, UAE. Credit: Shutterstock.

2.2. Fuelling a latent capability race

Even before AI is deployed in weapons, it can "disrupt strategic stability due to new perceptions of threats."[49] A state that rushes to invest in civilian AI capabilities may achieve an advantage over others, creating a perception of vulnerability among neighbouring countries, which will, in turn, seek to catch up. This thus leads to what can be referred to as a latent-capability or dual-use AI race.[50] This might already be the case in the Middle East.

While countries seek to achieve AI advances for economic reasons, they may also be racing to develop capabilities that could, in the future, be relevant, ancillary or transferable to a military context. This would create regional dynamics similar to those of a nuclear fuel cycle race, in which a state develops an indigenous nuclear fuel cycle with a view to the possibility that it could spur the development of a nuclear weapon programme in the future.[51] In both cases – AI and a nuclear fuel cycle – countries developing such capabilities as well as their neighbours may overestimate the real extent of these capabilities or how they could be used. Multiple factors compound this problem, including the blurring of lines between peaceful and military applications of AI, its inherently dual-use nature, the fact that it is largely private sector-led, and the difficulty distinguishing between military and non-military AI spending.[52] This may create new regional security challenges or at least new security dynamics.

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[49] See Puscas, *AI and International Security*, p. 51.

[50] Ibid.

[51] This is not to claim that a fuel cycle race is underway in the Middle East; the example is just used for the sake of comparison.

[52] Kasapoglu, "Unexpected Pioneer," 61.

A security camera in Israel. Credit: Djampa / Wikimedia.

While mapping regional AI capabilities is beyond the remit and scope of this report, it is worth looking at some trends and figures to demonstrate the variation in technological maturity and AI uptake across the region and how this may play out. The contribution of AI to national annual growth is expected to lie in the range of 20–34 per cent per year across the region by 2030, with the fastest growth being witnessed in GCC countries, that is, the UAE, followed by Saudi Arabia and Qatar, and then Israel.[53] In absolute terms, the largest gains are expected to accrue to Saudi Arabia, where AI is expected to contribute over US$135.2 billion in 2030 to the economy, equivalent to 12.4 per cent of gross domestic product (GDP).[54]

The motivation and approach of different Middle Eastern countries to AI also vary. The push for AI among GCC members has been largely driven by the UAE and Saudi Arabia, each of which appears to be competing to become a regional (if not global) leader in AI. The UAE was the first Arab country to establish a Ministry for AI, and it recently unveiled an AI technology firm that could surpass $100 billion in assets within the next few years.[55] Saudi Arabia also announced the establishment of a $40 billon fund to invest in AI, which would make it the world's largest current investor in AI.[56] The investment approach of both countries appears to encompass the entire supply chain of AI, targeting semiconductors (design and manufacturing of microchips), AI infrastructure (data centres and connectivity), and related technologies (AI models, software,

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[53] Most of the growth is assumed to be a result of improved productivity and technology. See Shivangi Jain, *US$320 billion by 2030? The Potential Impact of AI in the Middle East* (PWC, 2018), 3, https://www.pwc.com/m1/en/publi-cations/potential-impact-artificial-intelligence-middle-east.html. For Israel and Qatar, see "Artificial Intelligence – Israel," *Statista*, March 2024, https://www.statista.com/outlook/tmo/artificial-intelligence/israel, and "Artificial Intelligence – Qatar," *Statista*, March 2024, https://www.statista.com/outlook/tmo/artificial-intelligence/qatar.

[54] Jain, *US$320 billion by 2030?* 4.

[55] Adam Lucente, "What to Know about MGX, UAE's Latest AI Investment Firm," *Al-Monitor*, 12 March 2024, https://www.al-monitor.com/originals/2024/03/what-know-about-mgx-uaes-latest-ai-investment-firm.

[56] Jack Dutton, "With $40B Fund, Saudi Arabia Looks to Become World Leader in AI," *Al-Monitor*, 20 March 2024, https://www.al-monitor.com/originals/2024/03/40b-fund-saudi-arabia-looks-become-world-leader-ai.

life sciences, and robotics). Aside from the economic and commercial benefits behind these investments, another likely motivation for each of these two countries would be to position itself to play a central role in global AI markets in order to become a beneficiary of AI-related progress. It could then potentially use its leverage to restrict others from gaining access to that progress, including future military applications.[57] On the military side, both countries have been increasingly adopting AI in systems for military purposes such as air defence, tactical reconnaissance, logistics support, and medical evacuation, and both are claimed to be using AI-enabled technology for domestic security purposes, ranging from policing to surveillance.[58] While both Saudi Arabia and the UAE seem interested in developing indigenous capabilities, it is believed that they are purchasing AI from foreign suppliers or developing these systems through joint ventures with such suppliers.[59]

Israel, like other regional states, appears to have multiple motivations and interests in AI. It is developing and using AI systems for security purposes, such as the facial recognition technologies that are widely used in policing and surveillance in the Palestinian Territories.[60] It also develops and uses AI-enhanced weaponry for military purposes such as border monitoring, targeting, and missile defence systems.[61] Compared to other countries in the region, Israel has significant domestic military and security capabilities. It has a stronger route to the commercialization and export of defence technologies given the "many startups that emerge in the [Israel Defense Force's] ecosystem"[62] and given that it is already a major exporter of defence and security products. However, given Israel's sales-driven interest in AI, it is often difficult to verify claims made by Israeli industry about the capabilities of its products.[63]

Iran has been investing in AI research and development in a limited way and is believed to be at the early stages of the development of AI technologies. So far, it has narrowly focused on national security and military uses, while its private sector and commercial applications have advanced

[57] Sarkin and Sotoudehfar, "Artificial Intelligence and Arms Races in the Middle East," 108.

[58] See Simon Shooter et al., "Artificial Intelligence 2024: UAE Trends and Developments," *Chambers & Partners*, 28 May 2024, https://practiceguides.chambers.com/practice-guides/artificial-intelligence-2024/uae/trends-and-developments; "How Facial Recognition Transforms Access Control in the Middle East," *Scylla*, n.d., https://www.scylla.ai/how-facial-recognition-transforms-access-control-in-the-middle-east/, and Eva Thibaud, "UAE's High-Tech Toolkit for Mass Surveillance and Repression," *Le Monde Diplomatique*, January 2023, https://mondediplo.com/2023/01/05uae.

[59] Per-Ola Karlsson et al., *The AI Opportunity for Defence and Security* (PWC, 2024), https://www.strategyand.pwc.com/m1/en/strategic-foresight/sector-strategies/aerospace-defence/ai-in-defence-and-security.html.

[60] "Report: IDF using facial recognition tools to identify, detain suspects in Gaza," *The Times of Israel*, 27 March 2024, https://www.timesofisrael.com/report-idf-using-facial-recognition-tools-to-identify-detain-suspects-in-gaza/; Anwar Mhajne, "Israel's AI Revolution: From Innovation to Occupation," *Carnegie Endowment for International Peace*, 2 November 2023, https://carnegieendowment.org/sada/2023/11/israels-ai-revolution-from-innovation-to-occupation?lang=en; see also Antony Lowenstein, *The Palestine Laboratory: How Israel Exports the Technology of Occupation Around the World* (London: Verso, 2023).

[61] Noah Sylvia, "The Israel Defense Forces' Use of AI in Gaza: A Case of Misplaced Purpose," *Royal United Services Institute (RUSI)*, 4 July 2024, https://www.rusi.org/explore-our-research/publications/commentary/israel-defense-forces-use-ai-gaza-case-misplaced-purpose.

[62] Stephan De Spiegeleire, Matthijs Maas and Tim Sweijs, "Defense Yesterday, Today and Tomorrow," in *Artificial Intelligence and the Future of Defense: Strategic Implications for Small and Medium Sized Force Providers* (The Hague Centre for Strategic Studies, 2017), 81, https://www.jstor.org/stable/resrep12564.

[63] Ibid.

at a much slower pace. Iran faces considerable difficulties resulting from sanctions that limit its ability to invest in the infrastructure required to develop AI and access AI technologies. Despite the sanctions, Iranian officials have claimed to have developed indigenous capabilities in military systems, such as drones, command, control, communications, computers and intelligence (C4I), and integrated air defence networks, which may indicate an ability to pursue advanced AI development.[64] Iran has made numerous claims about its ambitions to incorporate AI into its military, but, as with Israel, it is difficult to verify such claims.[65]

In short, Saudi Arabia and the UAE have the economic resources needed to sustain the heavy investments required to lead on AI; Israel may have the most developed technological ecosystem along with a mature defence-technological and -industrial base and a strong economic route to commercialization; and Iran has a strong scientific tradition, a reverse-engineering base and an adeptness for working with limited resources given years of international sanctions.[66] The unique aspect of this latency race is the lack of export controls on AI technology compared to other dual-use technologies, such as civilian nuclear energy, and the fact that it is mostly led by the private sector. The implications this may have for regional security and stability are still unknown, but the race dynamics in general are not viewed positively, given their zero-sum formulation.

2.3. Affecting regional WMD proliferation and arms control processes

Several states in the Middle East possess, have previously sought to acquire, or are believed to be still interested in acquiring WMD, including chemical, biological, and nuclear weapons. While the motivation for each of these states to acquire WMD may differ, the probable common thread is that it stems from insecurity. The adoption and widespread use of AI for military applications and an AI arms race might lead to an increase in the desire of countries to seek WMD to address this sense of insecurity. Equally, it might lead to a decrease in that desire. This subsection explores these possibilities and their impacts on arms control in general and the realization of the ME WMDFZ in particular.

Increased WMD proliferation risks

The widespread application of AI for military purposes in the region could encourage existing or would-be proliferators to double down on their efforts to develop or acquire WMD. This would be an attempt to maintain some parity with those states that have more effectively embraced and incorporated AI into their military capabilities. AI could also, in principle, make a number of

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[64] [Artificial intelligence has entered military equipment], *ISNA*, 27 November 2023, (in Persian) https://www.isna.ir/news/1402090603780/پای-هوش-مصنوعی-به-تجهیزات-ارتش-باز-شد.

[65] IRGC Drones Capable of Targeting Far Away," and Rezaie, [Utilization of Artificial Intelligence].

[66] Kasapoglu, "Unexpected Pioneer," 70. There are additional countries in the Middle East that invest in or are looking to invest in AI (e.g., such as Qatar, Egypt and Morocco), but the size of their stake in the AI race is unknown.

WMD-development processes (e.g., uranium enrichment or pathogen development) easier by reducing technical difficulties, associated costs, or the time required.[67]

The potential impact of AI on the proliferation drive of countries that already possess WMD is unknown. AI could enable them to make their WMD more lethal, especially in the realm of biological weapons, where novel or more virulent pathogens could be developed. Similarly, AI could improve the capabilities of the means of delivery of WMD, such as WMD-enabled missiles or drones that depend on AI for their operation and are used as an additional deterrent or strike capability. Relatedly, global counter-proliferation efforts and regimes may be further weakened from a political

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> **The widespread application of AI for military purposes in the region could encourage existing or would-be proliferators to double down on their efforts to develop or acquire WMD to maintain some parity with those who have more effectively embraced and incorporated AI into their military capabilities.**

perspective, given the unravelling of norms around WMD and the decline in multilateral non-proliferation frameworks caused by increased geostrategic competition.[68]

Decreased WMD proliferation risks

Conversely, the widespread application of AI for military purposes in the region could decrease the utility of WMD. It has already been argued that the increased range, reliability, accuracy, and lethality of conventional systems such as ballistic missiles, drones, and swarms and the future availability of hypersonic missiles have decreased the utility of WMD.[69] Ballistic missiles and UAVs have become commonplace in the region, and if current trends are any indication, they are likely to continue to play a central role in future conflicts.[70] Hypersonic missiles are potentially a game-changer for the region's future military balance, but the trajectory of their development, application, and features is still somewhat unknown. The widespread application of AI in these and other systems may further the trend and diminish the importance of WMD, thereby decreasing proliferation risks.

From a technical perspective, advances in AI could also lead to decreased WMD proliferation risks if AI technologies were to bolster the detection, verification, and implementation of and

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[67] For a good overview, see Jingjie He and Nikita Degtyarev, "AI and Atoms: How Artificial Intelligence is Revolutionizing Nuclear Material Production," *Bulletin of the Atomic Scientists* 79, no. 5 (September 2023): 316–328, https://doi.org/10.1080/00963402.2023.2245251. See also Puscas, *AI and International Security*, 53.

[68] From a technical perspective, AI tools and technologies may help counter-proliferation efforts, which is covered in Subsection 2.4.

[69] Nasser bin Nasser, *Means of Delivery: Complex and Evolving Issue in the Middle East WMD-Free Zone Initiative*, (Geneva: UNIDIR, 2022), 6, https://doi.org/10.37559/MEWMDFZ/2022/meansdelivery.

[70] Ibid., 13.

compliance with current and future arms control processes. Several international organizations involved with monitoring proliferation activities and the verification regimes of relevant treaties, including the IAEA[71] and the Organisation for the Prohibition of Chemical Weapons, noted they are exploring ways in which AI can support their missions.[72] AI could effectively "expand the toolbox"[73] of the non-proliferation community, including through:

▶ Automated analysis of satellite imagery, which could assist in detecting proliferation activities at declared sites or clandestine activities that would otherwise be undetected by traditional safeguards

▶ Using machine learning algorithms to verify compliance with arms control agreements by comparing declared data with observed data for consistency and identifying any discrepancies

▶ Modelling WMD proliferation networks and illicit trade that could help detect and interdict proliferation activities

While many of these applications are in the early stages of development and have yet to be deployed in a real-world context, they reflect the growing recognition of AI's relevance in WMD non-proliferation efforts.[74]

2.4. Affecting the ME WMDFZ

This report's consideration of the role of AI in regional security and possible implications for the ME WMDFZ should not be taken to imply that AI is, or should be, part of its scope. The 1995 NPT Middle East Resolution calls upon states to establish "an effectively verifiable Middle East zone free of weapons of mass destruction, nuclear, chemical and biological, and their delivery systems."[75] Given the political realities of the region, as well as the global uniqueness of the ME WMDFZ initiative as the only proposed zone to cover all WMD, it is already challenging and ambitious, and issues such as AI should not be addressed through it or bundled together with it. Nevertheless, developments witnessed in AI and their possible military, WMD, and non-proliferation and disarmament applications remain relevant to the ME WMDFZ and add an additional layer of complexity and possibly opportunities. There are three major issues of potential impact.

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[71] See, for example, the IAEA's workshop report on how AI and machine learning could advance safeguards surveillance: *Emerging Technologies Workshop: Insights and Actionable Ideas for Key Safeguards Challenges* (IAEA, 2020), 10, https://www.iaea.org/sites/default/files/20/06/emerging-tehnologies-workshop-290120.pdf.

[72] Report by The Director-General of the OPCW, "Response to the Report of the Scientific Advisory Board on Developments in Science and Technology to the Fifth Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention," 22 February 2023, 2, https://www.opcw.org/sites/default/files/documents/2023/02/rc5dg02(e).pdf.

[73] "AI and Non-proliferation: CNS Experts Lead the Way," *Middlebury Institute of International Studies*, 21 November 2023, https://nonproliferation.org/ai-and-nonproliferation-cns-experts-lead-the-way/.

[74] See, for example, James Revill and John Borrie (eds.), *Science and Technology for Monitoring and Investigations of WMD Compliance* (Geneva: UNIDIR, 2020), https://doi.org/10.37559/WMD/20/WMDCE11.

[75] 1995 NPT Review and Extension Conference, "Resolution on The Middle East," May 1995, https://undocs.org/NPT/CONF.1995/32(PartI).

Urgency

Whether the widespread application of AI for military purposes in general, or WMD in particular, increases or decreases the sense of urgency for policymakers to move forward on the ME WMDFZ is unknown. Ultimately, it boils down to the political impact of AI. It is largely believed that previous technological revolutions, such as the Information and Communications Technology Revolution and the Revolution in Military Affairs to which it led, did not have an impact on regional proliferation trends and the political will of Middle Eastern states in relation to the ME WMDFZ, and may not even have registered with them.

If the past is any indication of future trends, and even though – as this report argues – the AI technology revolution and the Revolution in Military Affairs to which it could lead are unprecedented, it is unlikely to sufficiently change states' perception of the threat of WMD to spur the region to push forward with the ME WMDFZ. Political factors would likely have a greater direct impact on the ME WMDFZ than technological ones. Having said that, if the trajectory of AI creates significant political changes, it could affect its prospects.

Timing and means

Whether AI should be discussed in a regional context and the forum in which those discussions should take place is wholly up to the states of the region to decide. Yet, at the risk of being prescriptive, if AI should be addressed, it should be done through a separate and standalone process that does not detract, distract, or bypass the ME WMDFZ process. Instead, this separate process could help inform ME WMDFZ discussions in a way that enhances the ability of negotiators to appreciate the impact of AI on WMD and the initiative.

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> The technical benefits of AI in arms control processes covered in previous section could provide important tools for the ME WMDFZ when drafting a treaty, and in the subsequent implementation, verification and compliance.

As to the issue of when this should happen, it is probably still too early. The timing will depend on the trajectory of AI and developments regarding international understanding surrounding it. The world as a whole is still grappling with and trying to understand the impact of AI on global security, and so it is hard to imagine that the Middle East will be a leader in addressing its impact in a regional or mini-lateral context.[76]

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[76] Nonetheless, individual states may be increasingly involved in international forums on these issues.

Impact of technical benefits of AI on arms control processes

The technical benefits of AI in arms control processes covered in Subsection 2.3 could provide important tools for the ME WMDFZ when drafting a treaty and subsequent implementation, verification, and compliance. Nonetheless, such benefits are also tied to the trajectory of AI and the extent to which it is possible to trust AI to handle and augment such processes.

There are still concerns over the vulnerabilities and lack of transparency and understandability of AI systems that could undermine their role in arms control processes, which are still developing rapidly. For instance, an AI system or tool might suggest non-compliance by a country, but this assessment could lack transparency and might not be readily understandable by policymakers. Navigating this will likely be a long-term process and will require sustained efforts in capacity-building, development of norms and guidelines, and confidence-building measures specific to using AI in arms control, non-proliferation, and disarmament processes.

The fourth session of the Conference on the Establishment of a Middle East Zone Free of nuclear weapons and other Weapons of Mass Destruction in 2023. Credit: Loey Felipe / UN Photo.

3. Recommendations and Conclusion

Facial recognition technology scan. Credit: AlinStock / Adobe Stock.

Admittedly, there is a serious shortage of recommendations for the region or its states to consider when it comes to AI.

One recommendation would be for states to consider the utility of developing national strategies or policies to govern AI, including its integration in the military and security domain. The development of such strategies could help states articulate their priorities, goals and aspiration as well as harmonize positions among different stakeholders domestically. It would also serve as a strong confidence-building measure among regional and international partners.[77]

Another recommendation for states to consider is what capacity-building efforts they could undertake on a national level to prepare for a future in which they could meaningfully engage in discussions on AI. This need is especially pronounced given the wide knowledge gap between states and their private sectors when it comes to AI. The idea behind such a recommendation is that national capacities would be required for any future regional efforts to address AI, if and when the time comes. This capacity-building approach to inform arms control, non-proliferation and disarmament processes is not novel and has been proposed by several experts and organizations who argue that technical capacities need to be built in advance of political readiness.[78]

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[77] See Yasmin Afina, *Draft Guidelines for the Development of a National Strategy on AI in Security and Defence: A Policy Brief* (UNIDIR, 2024), https://unidir.org/publication/draft-guidelines-for-the-development-of-a-national-strategy-on-ai-in-security-and-defence/.

[78] This was the cornerstone of the findings of the Nuclear Threat Initiative's Verification Pilot Project, specifically in Ian Anthony et al., *Innovating Verification: New Tools & New Actors to Reduce Nuclear Risks – Building Global Capacity* (Nuclear Threat Initiative, 2014), https://www.nti.org/wp-content/uploads/2014/07/WG3_Building_Global_Capacity_FINAL.pdf. Although focused on nuclear risk reduction, the capacity-building approach may be relevant to an AI context.

Relatedly, capacity-building was also the cornerstone of some arms control agreements, such as the Comprehensive Nuclear-Test-Ban Treaty: technical communities worked in advance of political readiness so that, when the adoption of the treaty was possible, the technical capacities were in place to implement it.

It is important not to exaggerate the utility of this recommendation for regional security, but it is a good starting point. Capacity-building efforts could entail basics such as awareness-raising and gaining familiarity with the lexicon. Likewise, any training should be focused on functional areas. To borrow an example from previous capacity-building efforts, training focused on how existing remote-sensing capacities used for land mapping and other civilian applications were found to be relevant in a non-proliferation context by highlighting how they could be used for verification.

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> **The need for capacity-building in the Middle East is especially pronounced given the wide knowledge gap between states and their private sectors when it comes to AI.**

This report highlights the impact of AI on regional security, finding that it is likely to fuel a new arms race or latent-capability race. On the other hand, it is unclear what impact AI will have on WMD proliferation risks and arms control processes in general and how it could affect the ME WMDFZ in particular – the most critical foundational block of regional security.

There are likely to be other unknown impacts of AI on regional security that are not covered by this report. Analysis of the sort conducted by this report tends to be speculative and predictive but could be valuable nonetheless in delineating future risks and opportunities. While the overall outlook is that AI will further destabilize the region, it may not end up being so bleak after all. The idea that AI could have a positive impact on regional security should not be discounted altogether.

Ultimately, much of this depends on the trajectory of AI itself (and on what it can and cannot do) and also on the ability of the international community to agree on norms around it. These agreements can either be bilateral – if such countries as the United States and China reach some understanding – or multilateral if new arrangements can be agreed upon and an associated international body is established to govern it. It would be surprising if the Middle East itself took the initiative to address AI on its own, but that should not be discounted either because recent events, such as the Saudi Arabian–Iranian de-escalation process, have also taken everyone by surprise. The challenge facing the regional states would be that few options for consideration have yet been set forth by the arms control community on how to control AI, even if these states were inclined to do so.

The Impact of Artificial Intelligence on Regional Security, Threat Perceptions and the Middle East WMD-Free Zone

With significant advancements in the field of artificial intelligence (AI), many countries have been seeking to integrate these technologies into military and defense industries, including in the Middle East. In this publication, the author examines and analyzes the impact of AI on regional security, weapons of mass destruction (WMD), proliferation-related risks in the Middle East, and its potential influence on the initiative to establish a WMD-Free Zone in the region. The author examines possible scenarios, such as the emergence of an arms race in military applications of AI among regional states, which could either increase WMD proliferation risks in the region or, conversely, help reduce them. The paper also discusses key factors AI may have in the negotiations to establish a WMD-Free Zone, including urgency and the potential technical benefits of AI in arms control processes.

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