On the Use of Artificial Intelligence in the framework of the Syrian War

This new piece of the Artificial Intelligence series[1] of the Budapest Centre for Mass Atrocities Prevention[2] will briefly compile publicly available data on the use of Artificial Intelligence (AI) technologies during the Syrian conflict. We wish to show the need for a universal regulation on the development and misuse of AI during conflicts from the perspective of mass atrocities prevention. In doing so, we do not wish to provide an exhaustive and detailed list of challenges and their respective international activities.

By highlighting the facts below, the Budapest Centre wishes to illustrate that Artificial Intelligence plays an increasing role in conflict scenarios and has become a tool for human rights violations. However, it also has the potential to play a positive role in genocide prevention, victims' support, and reconstruction.

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[1] See "The Rise of Artificial Intelligence: Risks from the Perspective of Mass Atrocities", *Budapest Centre for Mass Atrocities Prevention*, September 2020. https://www.genocideprevention.eu/files/AI_risks_article_FINAL.pdf; "The rise of Artificial Intelligence in the context of Mass Atrocities: Policies and Recommendations from International and Regional Organisations". *Budapest Centre for Mass Atrocities Prevention*, November 2020. https://www.genocideprevention.eu/files/AI__Organisations.pdf; "How AI can either exacerbate or prevent genocides: Reflection based on the 10 Stages of Genocide". *Budapest Centre for Mass Atrocities Prevention*, February 2021. https://www.genocideprevention.eu/files/10_stages__AI.pdf.

[2] See the activities and projects undertaken by the Budapest Centre to set up a Multipolar Task Force to Prevent Mass Atrocities in The Era of Geopolitical Change, Climate Threats to Security and Digital Transformation, in "Towards a Multipolar Task Force to Prevent Mass Atrocities in the Era of Geopolitical Change, Climate Threats to Security and Digital Transformation." *Budapest Centre for Mass Atrocities Prevention*, Jan. 2021, www.genocideprevention.eu/en/projects/241-towards-a-multipolar-task-force-to-prevent-mass-atrocities-in-the-era-of-geopolitical-change-climate-threats-to-security-and-digital-transformation.

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Introduction: The Syrian War, Mass Atrocities, Human Rights Abuses and International Response

Beginning in Tunisia at the end of 2010, the Arab Spring brought similar popular protests through various countries of the Arab world, from North Africa to the Middle East and Gulf. In March 2011, the Arab Republic of Syria also saw itself shook by a civil uprising, ignited after the arrest and torture of a group of children that did a graffiti of anti-government slogans in Daara[5]. The demonstrations requested not only the release of the children, but stood against the authoritarian, corrupt rule of the Al-Assad family and the recession and rising unemployment connected to the 2008 financial crisis. Protesters were met with an abhorrent level of violence: torture, arbitrary detentions and killings, ill treatment, censorship and forced confessions were documented by Human Rights Watch in April 2011[6]. By the end of July 2011, the defections to the Syrian Arab Army culminated in the formation of the Free Syrian Army: the wave of protests of a few months before had officially turned into a civil war. The following years were marked by intense escalation and factionalization of the conflict[7]. Consequently, the Syrian war has become increasingly complex, combining a series of proxy-wars whose human costs have been exorbitant. Many international humanitarian laws were continuously broken, and the Syrian population has endured with several war crimes and crimes against humanity—such as incarceration, enforced disappearances[8], extrajudicial killings[9], torture[10], sexual violence, humanitarian assistance blockage and bombing[11], destruction of cultural and world heritage sites, chemical weapon attacks[12], deliberate civilian targeting (health care facilities[13], schools, residential areas, etc.) culminating in over 13 million people displaced and 500,000 casualties[14]. As of today, the Syrian government has regained authority to most of the territory except for Idlib, the last opposition fort, and Turkey is occupying an important part of Syrian territory. Parties continue to disregard human rights in many ways[15].

There have been several, unsuccessful, attempts to resolve the Syrian crisis. A non-exhaustive list of them will be discussed in this paragraph. Under the mandate of the *United Nations Human Rights Council*, the *Independent International Commission of Inquiry on the Syrian Arab Republic* was established in 2011. Through reports, policy papers, thematic papers, briefings and investigations, the

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[5] "How Schoolboys Began the Syrian Revolution." *CBS News*, 26 Apr. 2011, www.cbsnews.com/news/how-schoolboys-began-the-syrian-revolution/.

[6] "Syria: Rampant Torture of Protesters." *Human Rights Watch*, 15 Apr. 2011, www.hrw.org/news/2011/04/15/syria-rampant-torture-protesters.

[7] This included the uprising of Islamist groups, such as ISIS, and the involvement of foreign actors bringing direct and indirect intervention.

[8] "Record of Enforced Disappearances." *Syrian Network for Human Rights*, Mar. 2021, https://sn4hr.org/blog/2021/03/04/record-of-enforced-disappearances1/.

[9] United Nations Security Council, "Out of Sight, Out of Mind: Deaths in Detention in the Syrian Arab Republic," A/HRC/31/CRP.1, February 3, 2016, http://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-%20CF6E4FF96FF9%7D/a_hrc_31_crp_1.pdf.

[10] "Genocide Prevention Case Studies: Introduction to Syria." *United States Holocaust Memorial Museum*, 2018, www.ushmm.org/genocide-prevention/countries/syria/case-study/introduction/syria.

[11] United Nations, "Urging Peaceful Transition in Syria, Secretary-General Tells Member States to Stop Blocking Essential United Nations Action, Good Ideas," news release, September 20, 2016, https://www.un.org/press/en/2016/sgsm18093.doc.htm.

[12] Commission of Inquiry on the Syrian Arab Republic, "Chemical weapons' attacks documented by the Commission", 2017. https://www.ohchr.org/SiteCollectionImages/Bodies/HRCouncil/IICISyria/COISyria_ChemicalWeapons.jpg.

[13] Physicians for Human Rights, Anatomy of a Crisis: A Map of Attacks on Health Care in Syria, http://www.phr.org/syria-map.

[14] See also United States Holocaust Memorial Museum, *Alert Sheet: Civilians in Syria*. https://www.ushmm.org/m/pdfs/Syria_Alert_Sheet.pdf; United States Holocaust Memorial Museum, 2018, *Is the Worst Yet to Come: On Going Mass Atrocity Risks in Syria*. https://www.ushmm.org/m/pdfs/Syria_Bearing_Witness_Report_031218.pdf; Al-Kahwati, Ashi, and Johanna Mannergren Selimovic. Swedish Institute of International Affairs, 2021, *Addressing Atrocity in Syria: New Challenges for Transitional Justice*. https://www.ui.se/globalassets/ui.se-eng/publications/ui-publications/2021/ui-paper-no.-2-2021.pdf.

[15] "Syria." *Human Rights Watch*, 2021, www.hrw.org/middle-east/n-africa/syria.

Commission has been committed to expose the heinous atrocities and grave human rights violations perpetrated within the country—including sexual and gender-based violence, detention and child rights.[16] In particular, in 2012, Kofi Annan, *Joint United Nations and Arab League Envoy to Syria*, presented a six-point peace plan to the UN Security Council, designed to end the conflict and resolve the crisis. The document was accepted by the Syrian government[17]. On the European level—one of "the largest contributors to the international response to the Syrian conflict"[18] in terms of financial support for those affected by the war—specific and targeted restrictive measures were taken in the form of sanctions against the government of Syria. Plus, direct support to the population was provided[19]. However, European and other international efforts to halt the crisis have been met by several vetoes on the part of Russia and China at the UN Security Council, blocking all possible actions and interventions[20]. More precisely, Russia vetoed thirteen resolutions that aimed at investigating the use of chemical weapons during the conflict, introducing general measures (such as a ceasefire, a truce in Aleppo and sanctions), addressing accountability (by urging the Security Council to refer the Syrian case to the International Criminal Court[21]) and protecting civilians (by denouncing the government crackdown on the opposition and its perpetration of severe violations of human rights). Finally, international and regional human rights organizations have strongly condemned the violent acts committed by Syrian security forces, denounced crimes against humanity and called for a harsher and more effective international response[22].

State of Play

This paper will focus on a particular instrument applied by a diversity of parties in the conflict: artificial intelligence technologies. This matter is of utmost importance but has not found enough attention from the international community. Not only the unregulated use and development of ISR (Intelligence, Surveillance and Reconnaissance) and military AI technologies have exponentially increased the scope for mass atrocities in Syria, but the country has practically become a ground-test battlefield in which those advancements are assessed and improved. Relevant, non-exhaustive, activities of some of the state and non-state actors taking part in the Syrian conflict will be described, and special attention will be drawn to the activities of some of the permanent members of the UN Security Council—who bear distinct responsibility to building up international capabilities to prevent

[16] More specifically, the Commission has conducted interviews with more than 8000 witnesses and victims and examined photographs, video recordings, satellite imagery, forensic and medical reports from both Governments and non-Governmental sources. See "Independent International Commission of Inquiry on the Syrian Arab Republic." OHCHR, www.ohchr.org/EN/HRBodies/HRC/IICISyria/Pages/AboutCoI.aspx.

[17]The six point peace plan called for a commitment to "work with the Envoy in an inclusive Syrian-led political process to address the legitimate aspirations and concerns of the Syrian people [...], stop the fighting and achieve urgently an effective United Nations supervised cessation of armed violence in all its forms by all parties to protect civilians and stabilise the country [...], ensure timely provision of humanitarian assistance to all areas affected by the fighting [...], intensify the pace and scale of release of arbitrarily detained persons, including especially vulnerable categories of persons, and persons involved in peaceful political activities [...] and respect freedom of association and the right to demonstrate peacefully as legally guaranteed", in "Kofi Annan's six-point plan for Syria. UN-Arab League envoy's plan calls for military pullback, establishment of temporary ceasefires and political dialogue". *Al Jazeera*, 2012. https://www.aljazeera.com/news/2012/3/27/kofi-annans-six-point-plan-for-syria

[18] "Syria." *European Neighbourhood Policy And Enlargement Negotiations - European Commission*, https://ec.europa.eu/neighbourhood-enlargement/neighbourhood/countries/syria_en

[19] Idem. As "EU cooperation aims at supporting the resilience of the population and paving the way for transition and post-conflict recovery and assistance is provided in sectors such as education, livelihoods, civil society capacity building, health, accountability and transitional justice", the European Union collaborates with UN agencies, international and Syrian NGOs, EU member states. For instance, the EU Strategy for Syria was adopted in 2017, accompanied by the Foreign Affairs Council Conclusions on Syria with its latest being approved and later endorsed by the European Council in 2019.

[20] Lasensky, Scott and Woocher, Lawrence. "Mass Atrocities in Syria: the International Response". *United States Institute of Peace*. 2011 https://www.usip.org/publications/2011/07/mass-atrocities-syria-international-response

[21] Idem. On this issue it has been reported that, "the Security Council has remained silent, failing to reach agreement on a draft resolution".

[22] Idem.

mass atrocity crimes despite their diverging geopolitical interests. Nonetheless, other actors in the conflict were also contemplated.

Russia

- According to a report published (under *Federal Government Contract*) by *CAN*, a U.S. non-profit research and analysis organization, Russia has been working on the modernization and the development of its military observing the outcomes of its battlefield operations in Syria[23]. Indeed, the country's "military leadership has [...] proclaimed the benefits of autonomy in the Russian military's experience in Syria"[24]: Russia has used the Syrian battleground[25] to put in use and evaluate different unmanned ground vehicles in order to carry out various activities and missions, such as demining; intelligence, surveillance and reconnaissance (ISR); logistics; combat missions[26]; use of robotics and unmanned vehicles; employment of technologies to disturb enemy signals. It is also "in the process of incorporating these lessons learned through conferences, roundtables, and new manuals"[27], thereby financially benefiting from the sale of that very same armament. Two examples of this military advancement are **Uran-9** and "**the Zavet**"[28], whose tests on Syrian ground allowed the Russian military to discover and identify system flaws, proceeding with the generation of improvements, solutions and upgrades[29].
- The deployment of AI weapons by Russia in Syria include the application of the tactical level "**Strelets-M**"—a modernized wearable intelligence, command and communication complex (KRUS)—which conducts strike drones on terrorist targets; and the testing of the "**Ratnik**", a personal combat uniform kit consisting of a system of advanced protective and communication tools, weapons and ammunition that allows "a soldier to get continuously updated information about the situation in the combat area".[30]
- Russia adopted jammers in order to disturb GPS-guided unmanned air vehicles[31] and deployed tests of two loitering drones, **Kub** and **Lancet**. The **Leer-3** system, a mid-range

[23] Edmonds, Jeffrey. Bendett, Samuel. Fink, Anya. Chesnut, Mary. Gorenburg, Dmitry. Kofman, Michael. Stricklin, Kasey and Waller, Julian. Artificial Intelligence and Autonomy in Russia. *CNA*, 2021, p. 77. https://www.cna.org/CNA_files/centers/CNA/sppp/rsp/russia-ai/Russia-Artificial-Intelligence-Autonomy-Putin-Military.pdf

[24] Idem, p. 115.

[25] "The Russian Defense Ministry is seeing the patterns of modern warfare in the Syrian conflict and is responding to them by investing in certain technologies and adjusting tactics. Syria presents the "contours of future war" — the kind of combat that involves unmanned systems, military robotics, precision-guided munitions, and robust C4ISR as well as information operations". Konaev, Margarita and Bendett, Samuel. "Russian AI-enabled combat: Coming to a city near you?". See *War on the Rocks*. 2019. https://warontherocks.com/2019/07/russian-ai-enabled-combat-coming-to-a-city-near-you/

[26] Idem.

[27] Thomas, Timothy. "Russian lessons learned in Syria. An assessment". *MITRE. Center for Technology and National Security*, 2020, p. 2. https://www.mitre.org/sites/default/files/publications/pr-19-3483-russian-lessons-learned-in-syria.pdf.

[28] It consists of a control vehicle equipped with artificial intelligence elements that can detect in real time the areas which are dangerous to tanks, thanks to its automated control system able to scan the ground and identify possible problems. After that, "targets are classified in terms of their immediate threat, and the system then composes a plan for destroying identified adversary equipment, with the coordinates of enemy vehicles sent to crews of anti tank weapons". See Thomas, Timothy. "Russian lessons learned in Syria. An assessment". MITRE. Center for Technology and National Security, 2020 p. 15. https://www.mitre.org/sites/default/files/publications/pr-19-3483-russian-lessons-learned-in-syria.pdf

[29] Field, Matt. In Syria, Russia found the chance to showcase its swagger–and its robot weapons. *Bulletin of the Atomic Scientists. 75 years and counting*. https://thebulletin.org/2019/06/in-syria-russia-found-the-chance-to-showcase-its-swagger-and-its-robot-weapons/

[30] "Russian 'soldier of the future' combat gear tested in Syria". *Tass. Russian News Agency*. 2017 https://tass.com/defense/947275

[31] Johnson, James. "Artificial intelligence & future warfare: implications for international security". *Defense & Security Analysis*, 2019, p. 6. https://d1wqtxts1xzle7.cloudfront.net/59014168/Defense___Security_2019.pdf?1556101098=&response-content-disposition=inline%3B+filename%3DArtificial_Intelligence_and_Future_Warfa.pdf&Expires=1624446812&Signature=Z48PdhF-q1GykWZT2BIArCPQzJ9SWDl5qO770S0BISnRGiwSdHZNf4NeTwf02-

unmanned aerial vehicle that can interfere with enemy cell towers and hijack cellular signals[32], was used too. The successful deployment of UAVs in Syria served Russia in its objectives to concretely see the battlefield for the first time, to spy on enemies during night-time and to correct artillery salvos. It is also likely that Russian soldiers were able to test a tool called **Glaz** ("The Eye"), a small camera and sensor package users launch from a flare gun that transmits data to soldiers while descending to the ground in a parachute[33].

- The deployment of short and mid-range ISR drone platforms in Syria has allowed Russia to intensify its flight missions in the country, which keeps being used as a testing area for Russia's unmanned ground vehicle (UGV) technology to be employed in different missions. In fact, "the MOD (Ministry of Defence) is using what it learned in Syria to build out domestic and international expertise in demining operations"[34] as the **Uran-6** and **Uran-9** UGVs were included in the Russia military arsenal after being tested in Syria. In particular, the "transformer robot" **Uran-9**—able to easily destroy enemy armoured vehicles and military aircrafts exclusively used during military operations with the Russian and Syrian armed forces, including actions to push militants back, in order to provide military assistance to Bashar Al-Assad's regime[35]. This device can "be operated by remote control or unleashed to perform autonomously. [...] The vehicle can automatically identify, detect, track and defend enemy targets and uses detour pathfinding for obstacle avoidance".[36]
- The "**Bylina**", a system "able to independently calculate and choose ways to attack enemy structures [...] and to analyze the battlespace situation, detect and determine the nature of the enemy's goals, and select a way to eliminate or suppress them, without the need for involvement by the system's human operator"[37], was also tested. Russia further applied an onboard information and control system called **IUS-35** which "consists of several separate computers that bring together separate information channels in the aircraft into a single information feed that provides 'intellectual support' to the pilot for target acquisition and aircraft combat manoeuvring".[38] It has resulted in an increase of the raids carried out per day thanks to "its ability to streamline pre-flight preparation and improve mental endurance by the pilot" [39].
- Russia provided support for its naval forces through the employment of an underwater reconnaissance robot called "**Galtel**" [40].

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[32] Konaev, Margarita and Bendett, Samuel. "Russian AI-enabled combat: Coming to a city near you?". *War on the Rocks*, 2019. https://warontherocks.com/2019/07/russian-ai-enabled-combat-coming-to-a-city-near-you/

[33] Ibidem.

[34] Edmonds, Jeffrey. Bendett, Samuel. Fink, Anya. Chesnut, Mary. Gorenburg, Dmitry. Kofman,Michael. Stricklin, Kasey and Waller, Julian. Artificial Intelligence and Autonomy in Russia. *CNA*, 2021, pp. 115-116. https://www.cna.org/CNA_files/centers/CNA/sppp/rsp/russia-ai/Russia-Artificial-Intelligence-Autonomy-Putin-Military.pdf

[35] Russian 'Transformers' robot tank killer tested in Syria. *The New Arab*, 2019. https://english.alaraby.co.uk/news/russian-transformers-robot-tank-killer-tested-syria

[36] Sharkey, Noel. "Killer Robots From Russia Without Love". *Forbes*, 2018. https://www.forbes.com/sites/noelsharkey/2018/11/28/killer-robots-from-russia-without-love/?sh=d161e42cf018

[37] McDermott, Roger. "Russia's Armed Forces Test and Refine Electronic Warfare Capability". *Eurasia Daily Monitor*, 2020. https://jamestown.org/program/russias-armed-forces-test-and-refine-electronic-warfare-capability/

[38] Edmonds, Jeffrey. Bendett, Samuel. Fink, Anya. Chesnut, Mary. Gorenburg, Dmitry. Kofman,Michael. Stricklin, Kasey and Waller, Julian. Artificial Intelligence and Autonomy in Russia. CNA, 2021, p. 103. https://www.cna.org/CNA_files/centers/CNA/sppp/rsp/russia-ai/Russia-Artificial-Intelligence-Autonomy-Putin-Military.pdf

[39] Ibidem.

[40] Idem, pp. 117-129.

United States

- In the United States, the Pentagon has established "**Project Maven**", an algorithmic-warfare team with the objective to investigate the role and support that AI may have in US counter-terrorism operations in Syria[41]. In particular, image recognition software could possibly be employed in remotely piloted aircrafts to detect terrorist activity in Syria[42].
- The **Switchblade**[43], mentioned in the *Pax* report "Where to draw the line Increasing Autonomy in Weapon Systems – Technology and Trends"[44], is a back-packable intelligence, surveillance, and lethal platform that can be used both manually and autonomously[45]. The same organization states that around 4,000 **Switchblades** have been deployed by the US Army in Afghanistan, and models have also been detected in Syria and Iraq.

China

- **Skynet**, the Chinese government's smart surveillance system, has been used in Syria[46].
- A video released by Hezbollah-affiliated media in 2016 showed Chinese-made **MZD-2 submunitions (type-90)** being carried out against Syrian rebels[47].

Turkey

- In 2018, Turkey employed the **MLRS (Multiple-launch rocket system)**–a high-mobility automatic system—to attack a convoy that was carrying arms and ammunition to the Kurdistan Workers' Party (PKK)/People's Protection Units (YPG) militants in northern Syria. Turkey has strongly made use of its unmanned systems in operations field, having "played a major role in this engagement through pinpoint ISTAR inputs, enabling quick reaction and precision strike opportunities".[48]
- Turkish Unmanned Ground Vehicles (UGVs) were deployed in military operations in Syria[49].

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[41] Johnson, James. Artificial intelligence & future warfare: implications for international security. *Defense & Security Analysis*, 2019, p. 6. https://d1wqtxts1xzle7.cloudfront.net/59014168/Defense___Security_2019.pdf?1556101098=&response-content-disposition=inline%3B+filename%3DArtificial_Intelligence_and_Future_Warfa.pdf&Expires=1624446812&Signature=Z48PdhF-q1GykWZT2BIArCPQzJ9SWDl5qO770S0BISnRGiwSdHZNf4NeTwf02-ayfFHF27Gjcu1lUgJs4kmw80rOVB02tenweEw9SLpBCesCepU~XF1Kx8zgq6D8AITft68OdDmqiaUdyRuypbEzYvlgiUXXBfBDddI8D6oBK6ymZC7duqHSZhDTIjZ4FhZP4Zyf9Wg2o0i3HLgEl7lvVwJjZqp-O0kSuzG6GE1xdFZm~6Y8sUT~zrn4ZB0w~Hgax8v4uXjtB~RGxJ26PvKL4ypp9~BcuR~9MwSWOXNFHv5vnRhtR-we9vCRNys-3TjAs9Vvo0RjaBkZ6mwIOdtPdg__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA

[42] Idem, p. 8.

[43] See "Switchblade® 300 - Tactical Missile System - Air, Sea, Ground." *AeroVironment, Inc.*, www.avinc.com/tms/switchblade

[44] Slijper, Frank. Pax for Peace, 2018, *Where to Draw the Line: Increasing Autonomy in Weapon Systems – Technology and Trends*. https://paxforpeace.nl/media/download/pax-report-where-to-draw-the-line.pdf

[45] Ibidem.

[46] Alaca, Sokmen Askin Inci. The Effect of Artificial Intelligence Technology on Politics and International Relations. *İstanbul Arel University*. https://www.researchgate.net/profile/Askin-Sokmen/publication/338595945_THE_EFFECT_OF_ARTIFICIAL_INTELLIGENCE_TECHNOLOGY_ON_POLITICS_AND_INTERNATIONAL_RELATIONS/links/5e1ee027299bf136303afd6f/THE-EFFECT-OF-ARTIFICIAL-INTELLIGENCE-TECHNOLOGY-ON-POLITICS-AND-INTERNATIONAL-RELATIONS.pdf

[47] Gross, Judah Ari. "Video Appears to Confirm Use of Attack Drones by Hezbollah." *The Times of Israel*, 11 Aug. 2016, https://www.timesofisrael.com/video-appears-to-confirm-use-of-attack-drones-by-hezbollah-in-syria/; Warrick, Joby. "Use of Weaponized Drones by ISIS Spurs Terrorism Fears." *The Washington Post*, 21 Feb. 2017, https://www.washingtonpost.com/gdpr-consent/?next_url=https%3a%2f%2fwww.washingtonpost.com%2fworld%2fnational-security%2fuse-of-weaponized-drones-by-isis-spurs-terrorism-fears%2f2017%2f02%2f21%2f9d83d51e-f382-11e6-8d72-263470bf0401_story.html%3futm_term%3d.1aa208ddef67&utm_term=.1aa208ddef67 .

[48] Kasapoğlu, Can and Kırdemir, Barış. "The Rising Drone Power: Turkey On The Eve Of Its Military Breakthrough". *EDAM. Centre for Economics and Foreign Policy Studies*, 2018, p. 20 https://edam.org.tr/wp-content/uploads/2018/06/CAN-the-rising-drone_word.docx.pdf

[49] Idem, p. 22.

- **Anka-S** drones were used by Turkey in its offensive against the Syrian Arab Army. These weapons have been considered as crucial to Turkey's success in the region. Syria represented the "combat debut"[50] for this model and **MAM-Ls** (Smart Micro Munition, a family of GPS/INS and laser-guided smart munitions produced by a Turkish defence industry manufacturer), since the country presents an extremely hostile electronic warfare environment[51]. Thanks to the widespread use of drones (consequently benefiting from low political exposure and even lower material and human costs), Turkey could rely on the presence of proxy groups in Syria[52]. Plus, it has also been reported that Turkish **TB2s** (unmanned combat aerial vehicles) equipped with Turkish-made guided bombs killed 449 people in north-western Syria during the first months of 2018. In its way to become one of the world's most prolific users of killer drones, Turkey has in fact used these weapons against ISIS in Syria (more specifically, in the northern part of the country), and the PKK[53]. In 2020, Turkey has decided to cooperate with a defence contractor in order to send out kamikaze drones equipped with biometric facial recognition to its border with Syria[54].

Iran

- Iranian Unmanned Aerial Vehicles (UAV) have been spotted in Syrian ground, deployed "against both Islamic State (IS) and Syrian opposition targets"[55]. Such devices reportedly have also been used against the Kurdish in Northern Iraq and have actively prevented members from the Yazidi community to return to their homes, as they are afraid of the strikes[56].

ISIS

- It is believed that ISIS has extended their UAV capabilities by acquiring "cheap and easily accessible civilian drones, either for surveillance and reconnaissance or for offensive purposes by fitting them with a variety of fixed or releasable explosives"[57]. The first documentation of interest in UAVs for surveillance goes back to August 2014, when the group purchased commercial drones to gather battlefield intelligence and document suicide bombings[58], while lethal UAV use can be first drawn back to October 2016, when a drone hit Kurdish and French

[50] Gao, Charlie. "Turkey's Deadly Anka-S Combat Drones Are Earning Their Wings In Syria". *The National Interest*, 2020. https://nationalinterest.org/blog/buzz/turkeys-deadly-anka-s-combat-drones-are-earning-their-wings-syria-140947
[51] Ibidem
[52] In fact, "in a proxy-war environment not only are drones cheaper to manufacture and more quickly deployable than conventional combat jets, but they are also easier to disassemble and smuggle". See Borsari Federico. "The Middle East's Game of Drones: The Race to Lethal UAVs and Its Implications for the Region's Security Landscape". ISPI, 2021. https://www.ispionline.it/en/pubblicazione/middle-easts-game-drones-race-lethal-uavs-and-its-implications-regions-security-landscape-28902
[53] Farooq, Umar. "THE SECOND DRONE AGE. How Turkey Defied the U.S. and Became a Killer Drone Power". *The Intercept*, 2019. https://theintercept.com/2019/05/14/turkey-second-drone-age/
[54] Humphreys, Joe. Rise of the killer robots: The future of war. *The Irish Times*, 2020. https://www.irishtimes.com/culture/rise-of-the-killer-robots-the-future-of-war-1.4139390
[55] Borsari, Federico. Italian Institute for International Political Studies (ISPI), 2021, *The Middle East's Game of Drones: The Race to Lethal UAVs and Its Implications for the Region's Security Landscape*. https://www.ispionline.it/en/pubblicazione/middle-easts-game-drones-race-lethal-uavs-and-its-implications-regions-security-landscape-28902
[56] See *Turkey, Iran Deploy 'Game-Changing' Drones in North Iraq*. France 24, 1 Oct. 2020, www.france24.com/en/20201001-turkey-iran-deploy-game-changing-drones-in-north-iraq.
[57] Borsari, Federico. Italian Institute for International Political Studies (ISPI), 2021, *The Middle East's Game of Drones: The Race to Lethal UAVs and Its Implications for the Region's Security Landscape*. https://www.ispionline.it/en/pubblicazione/middle-easts-game-drones-race-lethal-uavs-and-its-implications-regions-security-landscape-28902
[58] Warrick, Joby. "Use of Weaponized Drones by ISIS Spurs Terrorism Fears." *The Washington Post*, 21 Feb. 2017, www.washingtonpost.com/world/national-security/use-of-weaponized-drones-by-isis-spurs-terrorism-fears/2017/02/21/9d83d51e-f382-11e6-8d72-263470bf0401_story.html?utm_term=.1aa208ddef67

positions in Northern Iraq, killing two people[59]. It has also been reported that those devices have increased the strategic stance of Daesh against the Iraqi Security Forces during the Battle of Mosul in 2016[60].

- A 2016 report also states that ISIS has shown interest in using UAVs to deliver WMD, such as chemical and biological weapons. It was disclosed that five Iraqi men have been arrested by their homeland's authorities after carrying out three workshops to ISIS on how to manufacture chemical agents and place them in "toy planes"[61].
- Different kinds of drone bombs were deployed by ISIS: **40mm grenades** (mostly used in Iraq, especially in Mosul); unknown and unidentifiable warheads; grenades, considered a mainstream ISIS weaponry (detected in Iraqi Tal Afar, and the Syrian towns of Hama and Homs); **shell warhead** (seen in Syria, in Deir Ezzor, Raqqa and Salahuddin Province); **white shell**, which actually seems to be conventional weapons (identified in Iraq, in the vicinities of Al Rutbah); **leaflets** (seen in a video, being deployed in the Syrian city of Deir Ezzor)[62]; and kamikaze bombers (operated in the same locality)[63].
- Finally, recent academic research also points out that remote-piloted aircrafts (RPA) have been employed by non-state groups "to claim legitimacy and effective control of territory, introducing—in the case of the Islamic State in Iraq and Syria (ISIS)—a claim to de facto sovereignty"[64]. According to the authors, UAVs are conceived not only as combat air support, but as "an integral part of ISIS propaganda machine"[65], appealing to the symbolic use of such drones and working to gain both military-strategic and political battles.

Hezbollah

- There is evidence to support that the Lebanese Hezbollah has in its possession the Iranian **Ababil-2T** UAVs and that it has been employed to support the group's military campaign in Syria[66].

On the positive side

While some use AI technologies for destruction, others focus on its constructive potential. As the scope of this paper englobes the overall use of AI technologies in the framework of the Syrian conflict, it may be useful to acknowledge not only the malignant employment of these devices but also their potential to play a key, positive, role in mass atrocities prevention, victim rehabilitation, accountability, justice, and reconstruction:

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[59] Gibbons-Neff, Thomas. "ISIS Used an Armed Drone to Kill Two Kurdish Fighters and Wound French Troops, Report Says." *The Washington Post*, 11 Oct. 2016, www.washingtonpost.com/news/checkpoint/wp/2016/10/11/isis-used-an-armed-drone-to-kill-two-kurdish-fighters-and-wound-french-troops-report-says/

[60] Idem. See also Watson, Ben. "The Drones of ISIS." *Defense One*, 12 Apr. 2021, www.defenseone.com/technology/2017/01/drones-isis/134542/

[61] Rassler, Don. Combating Terrorism Center at West Point, 2016, *Remotely Piloted Innovation: Terrorism, Drones and Supportive Technology*, p. 35. https://www.ctc.usma.edu/wp-content/uploads/2016/10/Drones-Report.pdf. See also Joby Warrick, "Exclusive: Iraqi scientist says he helped ISIS make chemical weapons," The Washington Post, 21 January 2019, https://www.washingtonpost.com/world/national-security/exclusive-iraqi-scientist-says-he-helped-isis-make-chemical-weapons/2019/01/21/617cb8f0-0d35-11e9-831f-3aa2c2be4cbd_story.html; Jamie Crawford, "Report warns of ISIS developing drones for chemical attacks," CNN, 20 October 2016. https://edition.cnn.com/2016/10/20/politics/terrorist-groups-and-drones/index.html

[62] Waters, Nick. "Types of Islamic State Drone Bombs and Where to Find Them." *Bellingcat*, 24 May 2017, www.bellingcat.com/news/mena/2017/05/24/types-islamic-state-drone-bombs-find/.

[63] Watson, Ben. "The Drones of ISIS." *Defense One*, 12 Apr. 2021, www.defenseone.com/technology/2017/01/drones-isis/134542/.

[64] Archambault, Emil, and Yannick Veilleux-Lepage. "Drone Imagery in Islamic State Propaganda: Flying like a State." *International Affairs*, p. 956, vol. 96, no. 4, 2020, doi:10.1093/ia/iiaa014.

[65] Ibidem.

[66] Idem.

- A group of researchers from the *Chapman University*, in California, utilizing deep-learning techniques, label augmentation and spatial and temporal smoothing examined how high-resolution satellite-imagery, processed through a specific AI model called **Convolutional Neural Networks** (CNN), can be employed to reconstruct Syrian cities, automatically identifying building destruction by detecting potential anomalies[67]. Interestingly, this automated destruction monitoring method can also be applied to render data collection more efficient during conflict, as it still heavily relies on eyewitness reports and manual detection. This advancement will allow data generation "with unprecedented scope, resolution, and frequency—only limited by the available satellite imagery"–and therefore, exponentially heighten the capacities of **"**media reporting, humanitarian relief efforts, human rights monitoring, reconstruction initiatives, and academic studies of violent conflict"[68].
- Another example of a beneficial use of AI technologies has been related to documentation: The *Syrian Archive*, a project run under the NGO *Mnemonic*[69], has developed a transparent and replicable methodology to collect, preserve, process, verify and investigate data on human rights violations in Syria rendered public by human rights investigators, advocates, media reporters, and journalists. This initiative is an incredible tool not only to provide accountability (by granting enough evidence to prove intent and war strategies)[70], but also to "humanise victims, reduce the space for dispute over numbers killed, help societies understand the true human costs of war, and support truth and reconciliation efforts"[71]. A similar initiative has been proposed by *VFRAME*—which brings the latest developments in computer vision to human rights research—as they have developed a cluster munition detection algorithm in order to automate the analysis of several million videos and locate their use in Syria.
- According to the estimate of the *World Health Organization*, more than 1 million Syrians have sought refuge in Lebanon since the conflict began and one-fifth of them might suffer from mental health disorders. As a response to this critical situation and the need for adequate professional help, the Silicon Valley start-up *X2AI*, in collaboration with a non-governmental organisation called *Field Innovation Team* (FIT), has developed "an artificially intelligent chatbot called **Karim** that can have personalised text message conversations in Arabic to help people with their emotional problems"[72], providing a proper response in the form of comments, questions and recommendations. A Syrian refugee who fled to Lebanon reported that talking to Karim "felt like I was talking to a real person" and that "a lot of Syrian refugees have trauma and maybe this can help them overcome that."[73]
- The *Syria Casualties Project*, run by *Carnegie Mellon University's Center for Human Rights Science* (CHRS) and *Human Rights Data Analysis Group* (HRDAG), have been developing a video analysis toolbox for human rights work in order to estimate mass atrocities casualties in Syria. Moreover, the machine learning and computer vision-based video analysis system called **Event Labeling through Analytic Media Processing** (E-LAMP) has been created by

[67] Mueller, Hannes, et al. "Monitoring War Destruction from Space Using Machine Learning." *Proceedings of the National Academy of Sciences*, vol. 118, no. 23, 2021, doi:10.1073/pnas.2025400118, https://arxiv.org/pdf/2010.05970.pdf.
[68] Ibidem.
[69] See "About." *Mnemonic*, www.mnemonic.org/en/about.
[70] See Abdulrahim, Raja. "AI Emerges as Crucial Tool for Groups Seeking Justice for Syria War Crimes." *The Wall Street Journal*, Dow Jones & Company, 13 Feb. 2021, www.wsj.com/articles/ai-emerges-as-crucial-tool-for-groups-seeking-justice-for-syria-war-crimes-11613228401; Hao, Karen. *Human Rights Activists Want to Use AI to Help Prove War Crimes in Court*. MIT Technology Review, 10 Dec. 2020, www.technologyreview.com/2020/06/25/1004466/ai-could-help-human-rights-activists-prove-war-crimes/.
[71] "About." *Syrian Archive*, www.syrianarchive.org/en/about.
[72] Solon, Olivia. Karim the AI delivers psychological support to Syrian refugees. *The Guardian*, 2016. https://www.theguardian.com/technology/2016/mar/22/karim-the-ai-delivers-psychological-support-to-syrian-refugees
[73] Ibidem.

the same university in order to monitor conflicts and human rights abuses and has already been applied to the Syrian case[74].

Conclusion

- The Syrian battleground has explicitly and repeatedly been used to test the efficacy of AI weapons, thereby identifying possible improvements. Since these products are later sold, civilian populations are targeted--ethnic minorities in particular, such as the Kurds and the Yazidis--accounting to violations to their right to life and the rule of proportionality[75] for the sake of profitable commercialization by arms industries.
- Certain AI technologies--such as drones, for instance--are increasingly accessible to private individuals. Therefore, non-state actors can easily purchase these devices. This allows terrorist organizations, such as ISIS, to acquire this sort of equipment, possibly contributing to the escalation of their atrocities.
- The Budapest Centre shares the concerns expressed by the *Global Centre for the Responsibility to Protect*, which, in 2020, stated that "throughout the past nine years the UN Security Council has consistently failed to uphold its responsibility to protect the Syrian people"[76]. This created an environment of unaccountability and impunity for war crimes and crimes against humanity.
- The international community—including the *Independent International Commission of Inquiry on the Syrian Arab Republic*—has not been paying adequate attention to the impact of artificial intelligence when investigating the "widespread and systematic gross human rights violations—amounting to crimes against humanity"[77] in Syria.
- Dissemination of more information and better transparency regarding the deployment and misuse of AI technologies within the Syrian conflict are key to raising awareness and effectively addressing the challenges relating to artificial intelligence in the context of mass atrocities.
- The ineffective international response to the Syrian conflict also hampered the universalization of legislation on the misuse of AI in conflict and on populations at risk of mass atrocities. The elaboration of a comprehensive, legally binding, document on the use and development of military and non-military AI devices is highly urgent, and its continued stalling will only put more lives in line.

[74] Aronson, Jay, et al. "Video Analytics for Conflict Monitoring and Human Rights Documentation." *Figshare*, Carnegie Mellon University, 30 June 2018, https://kilthub.cmu.edu/articles/journal_contribution/Video_Analytics_for_Conflict_Monitoring_and_Human_Rights_Documentation/6619340/1

[75] Please note that this rule is one of the most complex of IHL and "requires that the expected harm to civilians be measured, prior to the attack, against the anticipated military advantage to be gained from the operation" and is therefore "largely dependent on subjective estimates of value and context-specificity". See Heyns, Christof. "Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions". Human Rights Council Twenty-third Session Agenda item 3 Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development. United Nations General Assembly, 2013.

[76] "Syria: Nine Years of Atrocities, Impunity and Inaction." *Global Centre for the Responsibility to Protect*, Mar. 2020, www.globalr2p.org/publications/syria-nine-years-of-atrocities-impunity-and-inaction/.

[77] Nanda, Ved P. "The Security Council Veto in the Context of Atrocity Crimes, Uniting for Peace and the Responsibility to Protect". *CaseWestern Reserve Journal of International Law*. Vol. 52. Issue 1, 2020, pp. 120-121 https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=2568&context=jil