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Student Officer:Isabel Molenaar
Position:Co-Chair of GA1

Introduction

In the competition to lead the emerging technology race and the futuristic warfare battleground, artificial intelligence (AI) is rapidly becoming the centre of global power play. We can see that across many different nations, the development in autonomous weapon system (AWS) is progressing rapidly, and this increase in the weaponisation of artificial intelligence seems to have become a highly destabilising development. It brings complex security challenges for not only each nation's decision makers but also for the future of humanity. However, opinions are divided and the general benefits and limitations will be discussed in this report. Some general arguments of the benefits are that less human troops can be used, it is financially beneficial, and it is more ethical. On the other hand, there are also limitations such as lack of evidence and understanding of the weaponisation of AI, robots might not be able to distinguish between a civilian and combatant, and there is an issue of accountability.

Definition of Key Terms

Artificial Intelligence (AI)

According to OECD and UNCTAD, AI is defined as “the ability of machines and systems to acquire and apply knowledge and to carry out intelligent behaviour. This includes a variety of cognitive tasks such as but not limited to sensing, processing oral language, reasoning, learning, making decisions. They can also demonstrate an ability to move and manipulate objects accordingly. Intelligent systems use a combination of big data analytics,cloud computing, machine communication and the Internet of Things (IoT) to operate and learn.”1

Weaponisation

Weaponisation is the process during which something gets equipped with arms or it is turned into a weapon.2 Weaponisation of AI refers to the production of a machine with the purpose of creating an independent dangerous weapon that does not need manual controlling.3

Lethal Autonomous Weapons Systems (LAWS)

Lethal Autonomous Weapons Systems (LAWS) are also called ‘Killer Robots.’ They are a type of Autonomous Military Robot that are able to independently choose targets.Nations haven’t agreed on an international definition. Heather Roff, a writer for Case Western Reserve University School of Law, describes autonomous weapon

systems as, “armed weapons systems, capable of learning and adapting their ‘functioning in response to changing circumstances in the environment in which [they are] deployed,’ as well as capable of making firing decisions on their own.”4 On the other hand, the United Kingdom defines autonomous weapon systems as "systems that are capable of understanding higher level intent and direction. From this understanding and its perception of its environment, such a system is able to take appropriate action to bring about a desired state. It is capable of deciding a course of action, from a number of alternatives, without depending on human oversight and control - such human engagement with the system may still be present, though. While the overall activity of an autonomous unmanned aircraft will be predictable, individual actions may not be."5

Militarisation

Militarisation refers to when something or someone is trained in order to support or achieve military aims.6

Unmanned Aerial Vehicle

An Unmanned Aerial Vehicle (UAV) is commonly known as a drone. It is an aircraft without any humans on board.7 It can be controlled in various ways, either through remote control by humans or by computers on board of the UAV.

Espionage

The practice of spying in order to obtain information about the plans of a foreign government or a company.8 Espionage is considered a crime and has been criminalised by legislation.

Hybrid Warfare

“Hybrid Warfare consists of a combination of two or multiple forms of warfare. It's Clear that hybrid warfare refers to the simultaneous adoption of multiple modes of warfare.” According to European Union hybrid threat “is a phenomenon resulting from convergent and interconnection of different elements, which together form a more complex and multidimensional threat.”9 For example, an organisation might use military intimidation combined with diplomatic or technological means in order to achieve their aim.

General Overview

AI seems to be beneficial in most parts of our modern day society however, opinions are divided on the benefits and limitations of weaponization of AI. Brigadier General Pat Huston beliefs that weaponization of AI is inevitable and therefore the most important part is that we understand how we can regulate it legally and ethically. Huston also raised some interesting questions “What if AI-enhancements make autonomous weapons better than traditional weapons? What if autonomous

weapons are more precise and cause less collateral damage? Would we be legally obligated to use them, if available? Would we have an ethical obligation to pursue them?" All these questions are important to keep in mind if we want to be able to understand how we can deal with the weaponization of AI.10

An argument in favour of weaponization of AI is that less military troops can be used in conflict or a mission. This would mean that AI can replace human warfighters in the battlefield and thus lead to fewer casualties. This can also encourage nations to undertake more dangerous missions as they have to worry less about human casualties.11 The US Department of Defence further states that robots can replace boring tasks. For example, missions that take a long period of time. Furthermore, if the mission takes place in areas that are harmful for the human body such as places with high radioactivity robots can replace humans. A similar technique is already used nowadays as robots can be used for explosive disposal.12 A further advantage would be that AI robots can act on their own. If communication links with a military base stop working, they can be programmed to make their own decisions in unfamiliar situations.13

There are also financial benefits to the weaponization of AI. Department of Defence figures show that every individual soldier in Afghanistan costs the Pentagon around $850,000 a year. On the other hand the TALON Tracked Military Robot, a small armed rover, costs $230,000.14 According to General Robert Cone, former commander of the U.S. Army Training and Doctrine Command, the U.S. army could reduce the size of a brigade from four thousand to three thousand soldiers if these soldiers were to be replaced by robots. This would have no negative impact on the effectiveness of the army.15

A third and arguably the most significant benefit is related to ethics. Roboticist Ronald C. Arkin believes that it is possible that robots in the future will be able to act similar to humans on the battlefield. He states several reasons for this. Firstly, robots will not be influenced by the instinct to protect themselves. They won't be influenced by emotions such as fear which is beneficial for logical thinking in stressful situations. Secondly, they can process much more sensory information which enables them to observe their environment calmly and make valid judgements without the presence of any prejudice. Lastly, if a brigade would consist of a mix of robots and human soldiers, the robots can supervise the soldiers and report whether the soldiers break any ethical considerations. Usually, soldiers who work together are less likely to report this.16 According to Colonel Douglas Pryer of the U.S. army, soldiers' neural circuits can be affected which leads to lack of self-control and therefore performing ethical violations. Examples of ethical violations soldiers might perform is rape and torture.17

On the other hand, there are also limitations to the weaponization of AI. A counter-argument for the weaponization of AI is that there is a lack of evidence that robots in the near future would be able to function well enough in order to have accurate target identification, situational awareness, or make the right decisions in regards to

use of force (International Committee for Robot Arms Control).18 This could result in unnecessary harmful situations. Additionally, scientists from thirty-seven countries stated that "decisions about the application of violent force must not be delegated to machines" (International Committee for Robot Arms Control).

A second counter-argument is that robots will be able to choose their own targets and this could result in unfortunate situations. For example, they will find it hard to identify the difference between an innocent civilian and an armed combatant. This is related to an important concept in conflict which is 'The Principle of Distinction.` This is an international humanitarian law that states that in conflict no harm is allowed to be done on non-combatants. Theoretically, if the AI is programmed to make its own decisions on who to target, it can result in civilian casualties (Sharkey 687-709).19

A third limitation is that there is the issue of accountability. Ethicist Robert Sparrow argues that a significant part of international humanitarian law is that there will always be a person that is accountable for civilian casualties. If weaponization of AI is implemented, it is hard to find someone accountable for the killing of civilians as robots can't be taken accountable. Therefore, Sparrow believes robots should not be allowed in conflict (Sparrow 62-77).20 The main concern is that because AI make decisions on their own, it is hard to find out whether a detrimental mistake is due to an error in the AI's system or that the killing was deliberate. A real life example is self-driving cars. There is no driver who can be held accountable and if the car commits a traffic violation it would be unfair to punish the passengers.

Major Parties Involved

Soviet Union

In September 2017, Putin addressed a speech to students at the beginning of the school year in which he states "Artificial intelligence is the future, not only for Russia, but for all humankind. It comes with colossal opportunities, but also threats that are difficult to predict. Whoever becomes the leader in this sphere will become the ruler of the world."21

Putin is not the only one in support of the development of AI. Russian General Gerasimov told the military news agency Interfax-AVN that robots will play a leading role in future wars.

In 2015, Russian weapons maker, Degtyarev, was able to develop a tank with a 7.26mm machine gun.22 The tank is able to act autonomously, move silently and explodes in order to destroy surrounding tanks or buildings. Furthermore, Russia has developed another tank the Uran-9 which has no room for a crew on board and purely consists of weapons and

ammunition. This tank was deployed in Syria in order to test its abilities.23

United States

The United States believes that a ban on autonomous weapons is too premature. They support this statement with their argument that the weaponisation of artificial intelligence will have humanitarian and military benefits.

The United States are currently developing robotic tanks that can function autonomously and be remotely controlled. Additionally, the US Navy released in 2016 an autonomous war ship. The purpose of the new Navy ship is to contribute to a new tactic to counter Chinese maritime developments. The Chief of Naval Operations Admiral John Richardson stated that the increased competition with Russia and China called for new developments in the Navy and technological developments. The plan is to further expand the navy with more of these autonomous ships in order to strengthen the US Navy.24

United Kingdom

The Defense Ministry of the United Kingdom has stated that “the UK Government’s policy is clear that the operation of UK weapons will always be under human control as an absolute guarantee of human oversight, authority and accountability.” The United Kingdom prefers to define Lethal Autonomous Weapons Systems (LAWS) as “machines with the ability to understand higher-level intent, being capable of deciding a course of action without depending on human oversight and control.” Due to the fact that the United Kingdom has implemented a new definition for (LAWS) which differs from that in other countries, it is hard to understand their position.25 For example, the campaign group Drone Wars UK, revealed that the United Kingdom is funding the development of killer robots even though they stated in the past that they had no interest in it. The United Kingdom’s Defense and Security

Accelerator is funding research to develop more (LAWS) with no direct human involvement.26

Timeline of Events

1973	The first prototype system of the Phalanx CIWS was offered to the U.S. Navy for evaluation on the destroyer leader USS King.
Jan 25 1979	First human killed by a robot.
April 10 1981	The Convention on Certain Conventional Weapons was signed by 50 nations.
1st of March 1999	The Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction was put into force. SoftBank Robotics introduces a semi-humanoid robot called Pepper which can read emotions
March 25-29, 2019	UN Secretary-General AntoÌnio Guterres calls for a ban on killer robots. 'Convention on Certain Conventional Weapons (CCW)
…	…

Previous attempts to solve the issue

On the 3rd of September 2018 in Geneva, negotiations were held in regard to the creation of an international treaty that would ban Lethal Autonomous Weapons. However, little to no

progress was made as the military powers, the United States, Russia, South Korea, Israel, and Australia were against such plans.35 They believed that there are potential benefits to Lethal Autonomous Weapons and hope to investigate them more. They also stated that it is important to continue discussions on LAWS but would not agree on measures opposing'Killer Robots.'36 This is one of the main challenges that the UN faces in regards to this topic.

An interesting fictional regulation of 'Killer Robots' was created in 1942 by Isaac Asimov, a science fiction author. He came up with the Three Laws of Robotics (also called Asimov's laws). The first law of these set of rules states that: "a robot may not

injure a human being, or, through inaction, allow a human being to come to harm." The second rule states: "A robot must obey the orders given it by human beings except where such orders would conflict with the First Law." The third rule states: "A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws."37 Although these laws have been written by a science fiction author, they have influenced the thoughts on ethics in AI and would be a good inspiration for any future agreements that could be created.

Scientists and NGOs have been heavily involved in this debate. For example, Elon Musk of Tesla, famous theoretical physicist Stephen Hawking, and Mustafa Suleyman of GoogleDeepMind. They have been arguing for international bans on the development of 'Killer Robots' Although they haven't managed to get countries to come to a mutual international agreement, they have gotten a lot of recognition from the public. It is also important to note that the debate on a ban on the weaponisation AI is quite a recent issue and therefore future agreements are not outlawed.

Possible solutions

One of the first things that states should agree on is an international definition for Lethal Autonomous Weapons. A current issue is that most nations have their own definition of Lethal Autonomous Weapons. This makes it more difficult to agree upon effective international treaties as these treaties might not address the definition of LAWS. The fact that most nations have their own definition helps them to avoid possible regulations and limit further progress in discussions.38

It seems as it is hard to stop the development of AI as there already has been much progression. Therefore, we could focus on regulations. For example, we could create a set of rules that countries should follow when developing LAWS. This could prevent certain issues that would violate any ethical guidelines. These set of rules can be based on, for example, Asimov's rules. It should also be noted that there is the issue of whether robots can distinguish innocent civilians from combatants. In order to follow the humanitarian law 'The Principle of Distinction', we should try to find that solutions that will reduce the risk on innocent civilians. We could try and come up with a system that enables robots to distinguish soldiers from combatants. We could also give innocent civilians a chip or something similar to that. Of course ethical issues arise with this.

The need for transparency is also quite important in the development of LAWS. If coutnries keep their 'Killer Robots' secretive it will be hard to investigate whether they would follow new international agreements.

In order to have more control over AI we can suggest the requirement that there always should be partial human interference. For example, LAWS might be supervised from headquarters and can be stopped or reset in critical situations.

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