Introduction

In 2017, a video of Atlas, a robot resembling a human body in shape and size, made by a company called Boston Dynamics, went viral, gaining 17 million views on YouTube. The video shows Atlas jumping from one box to another, doing twists, and in the end, successfully completing a backflip (BostonDynamics).

Today, many governments and private companies around the world are working on developing similar robots and weapons that will be able to act outside of human control. This is a new category of weapons, called lethal autonomous weapons (LAWS). Currently, there are 30 countries around the world that use autonomous weapons in their militaries, but with human supervision (Delcker, “How Killer Robots...”). The use and development of lethal autonomous weapons dates back to WWI with the deployment of unmanned drones (McFadden). After that, the world powers have taken on the challenge of developing LAWS that can act with little to no human control and be more efficient and reliable than human soldiers. The goal of using LAWS instead of human soldiers and operators is to decrease the number of casualties during the war, meanwhile increasing the efficiency and reliability of the systems. Furthermore, LAWS are cheaper to make and sustain, which makes it easier to manufacture a pack of robots and deploy them into the battlefield.

Nonetheless, autonomous weapons provide a number of challenges. Firstly, in order to develop successful fully autonomous weapons, the Artificial Intelligence (A.I.) operating the machines must be able to recognize targets and distinguish civilians and soldiers, amongst other factors. Thus, the main concern about the A.I. in military robots is that it will not be able to do so, and will act unpredictably during real world combat situations, resulting in infringements of the established International Humanitarian Law (IHL). Many opponents of LAWS claim that militaries will not be able to create A.I. with such sophisticated capabilities in the near future.

Thus due to the controversies of autonomous weapons, to this day, the United Nations has not been able to pass any successful resolutions on the topic, or even define lethal autonomous weapons. Although “the technological process is fast … the UN is slow” (Piper).
Definition of Key Terms

Autonomy

In relation to Lethal Autonomous Weapons, automation is “the degree to which humans grant machines freedom to independently execute a task” (Klare). There exists a Spectrum of Autonomy for LAWS, with categories that include: fully autonomous, semi-autonomous, and supervised (Salmanowitz). Fully autonomous are LAWS that require zero human input in order to complete the task at hand. Semi-autonomous weapons can survey the surroundings and detect targets, but a human has to make the final decision of whether to attack the target or not. Lastly, supervised LAWS can function the same way fully autonomous systems do, but a human is constantly supervising the machine and has the right to intervene at any moment (Salmanowitz).

Lethal Autonomous Weapon Systems (LAWS)

Sometimes addressed as Autonomous Weapon Systems (AWS), Autonomous Weapons, or even, “Killer Robots.” LAWS are defined as weapons that can act independent from human control. The extent of human control is different for each weapon, and today, most of LAWS still have some human control or supervision. In the future, militaries around the world are hoping to achieve full autonomy of LAWS. This would allow the weapons “to survey their surroundings, identify potential enemy targets, and independently choose to attack those targets on the basis of sophisticated algorithms” (Klare). Such systems require profound Artificial Intelligence, development, and prior training and testing in order to complete these tasks without violating the Laws of War.

International Humanitarian Law

The International Humanitarian Law (Bouvier), is a lesser known name for what is commonly referred to as the Laws of War, or Laws of Armed Conflict (LOAC). However, the different names refer to the same document, which is the “International Humanitarian Law Applicable in Armed Conflicts.” Different types of Laws of War have existed since the dawn of conflicts, in all regions and major civilizations of the world. Thus, it is hard to determine when they were first established. Nonetheless, the modern Laws of War, the IHL, dates back to 1864 when the First Geneva Convention was created (Bouvier). The purpose of the IHL today, is to “to solve humanitarian problems that arise directly from international or noninternational armed conflicts.” The IHL's main points include: decreasing the extent of civilian suffering and deaths as much as possible, meaning that fighting civilians, or deliberately attacking civilian cities is prohibited. Killing and torturing prisoners is also against the law, and enemies that have surrendered must not be killed either. Any wounded on the battlefield must be cared for, no matter which side the person has
come from (Bouvier). To summarize, the IHL is a reminder to all militaries and governments across the world to do everything in order to decrease the number of all deaths, injured, and destruction.

**Distinction**

A term relating to IHL, which states that during military operations, when attacking, the operators, soldiers, or anyone else who it is applicable to, must know and respect the distinction between “lawful combatant targets” and “noncombatant targets like civilians, POWs, civilian property, etc” (Salmanowitz).

**Proportionality**

Proportionality is another term of the IHL, and in short, it states that no more force is allowed that exceeds the force needed to achieve the military objective. It can be thought of as a “cost-benefit” ratio between the military advantage gained by a certain operation and the harm it inflicted. The militaries are responsible for knowing where the line is between the harm inflicted and the advantage gained and make sure that they don't cross that line, or otherwise, it is a move against the IHL (Salmanowitz).

**Precaution**

Precaution is tightly connected to distinction and proportionality, and it is the measures taken to minimize the harm done to civilians by the army (Salmanowitz).

**Artificial Intelligence**

Artificial Intelligence (AI) is associated with computers performing human tasks. AI is developed by including characteristics of human intelligence, “such as the ability to reason, discover meaning, generalize, or learn from past experience” (Copeland). Forms of AI have been developed since the 1950s, but only recently have they begun to take on more complex forms that can start “mimicking” the human thinking (Delcker, “Attack on the...”). Thus, AI has gained much attention in the technology sector with companies such as Google and Facebook, along with many other companies spread around the world, trying to improve the current state of AI. Governments are also interested in developing AI, because it has to be used in LAWS for the machine to be able to survey its surroundings and detect targets.

**Martens Clause**

The Martens Clause was first introduced in the Hague Convention in 1899, and since then has been adopted by the International Humanitarian Law (“Martens Clause.” How Does Law Protect in War?). As stated in Protocol II (1977): “in cases not covered by the law in force, the human person remains under the protection of the principles of humanity and the dictates of the public conscience” (“Martens Clause.”)
Weapons Law Encyclopedia). The public conscience that is referred to in the clause represents the beliefs of the general public and the government on what is right and wrong (Docherty).

Background Information

Advantages of LAWS

There are many advantages to having lethal autonomous weapons for militaries around the world. Some of the advantages are humanitarian, while others are more business and strategy oriented. Firstly, LAWS will ensure less deaths in combat. Militaries around the world will be able to use robot soldiers and drones as their primary weapons, instead of sending hundreds of troops to fight. As the U.S. Military and many others around the world envision, the future of combat can look like “coordinated swarms” of autonomous robots that attack each other or certain targets, with no humans put in danger (Klare). This will increase the overall capabilities of the armies. Instead of sending a few drones that are fully controlled by humans, it will be possible to send a swarm of hundreds of drones that can attack and cooperate in unison with no humans involved or put at risk (Piper). Secondly, LAWS will be immensely cheaper for the army to create and sustain. Human armies in general need many more resources in order to keep a strong, motivated army. But for a swarm of robots, all that is needed is their development and some maintenance. For instance, the U.S. army has already tested a swarm of drones that have all been 3D printed, which is very advantageous for the army (Delcker, “Attack on the...”). Another advantage is that robots are not susceptible to getting tired, scared, or confused. The autonomous weapons deployed in the battlefield can fight 24 hours straight with the same efficiency at all times. Currently, when drones are released into the battlefield, many of them are controlled by a human that receives a live video translation of the drone’s surroundings. Thus, the drones always have to stay in a certain range in order to keep that communication with the human operator, and lag can be a problem too. Meanwhile, autonomous drones simply need to be deployed, and after they are able to complete the whole task by themselves, going wherever they need with no constraints (Piper). Lastly, some governments and organizations, most notably the United States, agree that LAWS will decrease the number of violations of International Humanitarian Law. It is argued that the robots will have a certain set of instructions that the A.I. will strictly follow. In fact, robots can be trained to recognize things better and more efficiently than humans in a complex situation (Piper). This will help commanders in the military to get more information about their targets and surroundings, and make better decisions about attacking (Liu).
Criticism and Challenges of LAWS

**Human Control in LAWS**

As mentioned before, LAWS can have different levels of autonomy. However, as the level of autonomy grows, it becomes trickier to establish a common ground on how much autonomy should be allowed and how to regulate the decisions it makes on an international scale. Some states, such as the U.S., argue that the control should be minimal, and that it will lead to better outcomes. Nonetheless, many other states, such as France, believe that the machines should not be fully autonomous due to the unpredictability factor that will still remain in the A.I. (Evans, “Lethal Autonomous Weapons...”). In relation to the Laws of War, it is important to decide how the violations of the laws will be punished when it comes to a fully or semi-autonomous system. Currently, when a Law of War is violated, a human is held accountable. However, what if an A.I. commits a violation against the Laws of War? Logically, if an autonomous weapon is supervised or is semi-autonomous, then the human in charge of that machine would be held accountable for what the machine does, because in the end, the human supervisor could have intervened and changed the behaviour of the machine. Nonetheless, as the human supervision and control gets minimal, maybe it will be unfair to charge the person supervising the machines of the crime. Some argue that the developers can be charged, the ones that put in place this specific machine or code (Evans, “Lethal Autonomous Weapons...”). Furthermore, if the punishment under the IHL for an A.I. system is determined to be less harsh than for a human, then LAWS can be used to kill soldiers and noncombatants without getting a punishment (Liu). Yet, this dilemma has not been resolved by the United Nations or any other entities to this day. Furthermore, as the human control over the machine becomes zero, many scientists believe that the A.I. inside can use its learning skills to change its strategies and interpret the instructions that were given to it by humans differently from what was intended. This way, the A.I. inside the machines can become a “black box” that humans have no control over and no idea about what is happening inside of its brain (Piper).

**Concerns Under the IHL**

The main concern of LAWS under the IHL is related to the idea of Distinction. Supporters of a ban on LAWS believe that the A.I. inside the machines will not be powerful enough to distinguish between a civilian and an enemy in a complex war scenario. Sometimes, the civilians can look like enemies or the other way around, and a machines might not distinguish the slight
differences. However, there are many scientists and developers that believe that such an algorithm can indeed be created and is feasible in the near future.

As to proportionality and precaution, there are similar debates and concerns about both of these concepts. It is unclear whether robots will be able to make the necessary judgement about the cost-benefit ratio of the operation they are doing. How will the A.I. know what contributes to a military advantage and at what point they have crossed the line? But, already, many “military commanders use systematic estimation methods” to calculate the cost-benefit ratio, so arguably AWS can be pre-programmed to do so as well (Salmanowitz).

Ethics of LAWS

Despite all the advantages and changes that LAWS can bring to the battlefield, there are many countries, organizations, and experts in the field speaking out against the use of LAWS for army purposes on the basis of ethics. The main arguments is that Artificial Intelligence cannot ethically make a “life and death” decision, because an A.I. will never be trained to have the same ethics and morals as humans do. For instance, generally around the world, killing another person without a clear justification is viewed as unethical, and those who have done such a crime are faced with a punishment (Klare). Thus, many argue that only humans can make the judgement of whether or not it is morally right to take a life of another person at any given instant.

The Possibility of another Arms Race

Many NGOs and governments are concerned about the possibility of LAWS creating another Arms Race. This time, the countries with the best A.I. systems will be able to create the best autonomous weapons. As seen in the Cold War, countries can get caught up in trying to outperform other countries's progress and innovations in the field. This will force the progress, resulting in “premature deployment” of the technologies. Governments may give LAWS more autonomy than they can handle, resulting in unfortunate consequences such as war crimes or escalation of conflict (Klare). As aforementioned, developing powerful A.I. in a closed, secret system, is dangerous because no one outside of the company or the government would be able to read the code and spot any important mistakes or bugs.

Furthermore, if and when the necessary artificial intelligence for autonomous weapons is developed, there will be dangers of that algorithm being used outside of autonomous weapons. For instance, authoritarian governments can use the A.I. in order to impose strict laws on their population or target a certain group of people in their country. Autonomous drones or security robots can be programmed to detect any member of an ethnic group and arrest them. Using the
same idea, if a government wants to impose certain rules that it wants the society to follow, robots can be used to impose those laws by force, punishing citizens that are violating the policies (Piper). This gives such authoritarian governments more power and ability to suppress human rights.

Lastly, the affordability of LAWS makes it accessible to non-governmental organizations. Once LAWS are developed and spread around the world, terrorist groups would easily be able to obtain them and use them in combat against sovereign nations and citizens. This would give more power to the non-state actors than they currently have. The fact that some LAWS can be 3D printed is yet another advantage that will make it easier to create a whole army of autonomous weapons if needed. Thus, it is arguable that it is not in the nation's advantage to design LAWS, as they will be used against themselves later on (Liu).

**Social Movements Against “Killer Robots”**

So far, there has been many social movements around the world against the use of “killer robots” in the military. An important example is the pledge on the Future of Life Institute website, which has been signed by important figures in the field of A.I. and technology, such as Elon Musk and the founder of Google’s DeepMind project. In total, “over 200 organizations and 3,000 individuals” pledged to “neither participate in nor support the development, manufacture, trade, or use of lethal autonomous weapons” (Evans, “Lethal Autonomous Weapons...”). The pledge can be found online and can be signed by any individual around the world. There are also many NGOs, such as the “Campaign Against Killer Robots” that are fighting for the complete ban on LAWS. Nonetheless, some argue that the social movements have already lost the fight, as major world superpowers such as China, Russia, and the United States have heavily invested in LAWS along with many other states. Over the years, the interest in LAWS will increase and the social movements won't be able to stop these militaries (Bartlett).

**Major Countries and Organizations Involved**

**United States of America**

The United States has been one of the main supporters of lethal autonomous weapons, and has already started developing their first autonomous systems in the Navy, the Air Force, and other sectors. The government believes that the implementation of LAWS into battle will improve the army's cooperation with the International Humanitarian Law, as the machines will have more accuracy and
efficiency than humans (Evans, “Lethal Autonomous Weapons...”). Thus, the state has been strongly against any ideas about the ban of LAWS, as they argue that the topic has not been explored enough yet, meaning it would be “premature” to ban them at this stage (Acheson). In order to develop the American LAWS, the army has pledged to invest 9 billion dollars into A.I. development, including the recognition of targets and increasing the autonomy of the machine (Bartlett). The Navy was successful at developing a ship called Sea Hunter that is fully functionable on its own with a purpose of surveying the oceans in search of enemy's submarines (Klare). The Air Force is currently developing autonomous aircraft and drones that will destroy enemy's “air defence radars” and find “enemy positions.” This includes swarms of drones that can fly in unison and attack a target or defend their position while exchanging information with each other. These drones have already been tested in the California desert. A major advantage of these drones is that they can be manufactured in thousands, as they are 3D printed, which makes them incredibly cheap for the military to obtain (Delcker, “Attack on the...”). These drones and the other aircraft in the development of the Air Force will have the function of operating autonomously even when contact is lost with the base (Klare).

Russia

Russia is another country that is in strong favor of LAWS and against its ban. The “chief of General staff of the Russian armed forces, General Gerasimov,” has stated that Russia is planning on automating the whole battlefield in the future (Sharkey). In its efforts to suppress an international ban on autonomous weapons, Russia was able to restrict the number of days of discussion on LAWS in the Convention on Certain Weapons from 10 to 7 (A Guest Blogger). Much like the United States and the United Kingdom, Russia believes that it is too early to ban the use and development of LAWS (E&T editorial staff). In order to establish more dominance in this area, Russia is investing more money and time into A.I. development than ever before. For instance, “In March 2018, government officials held a conference to encourage cooperation on AI between private companies and organizations and various government agencies” (Bendett). This said, Russia has moved ahead in its production of autonomous weapons. Firstly, it has developed “unmanned ground vehicles”, also known as tanks, called Uran-9 and Vikhr (Klare). The Uran-9 tanks have been deployed in Syria which has helped to improve the machines in combat environments. Russian private weaponry companies, such as Kalashnikov, the creator of AK-47, and Degtyarev, have also delved into autonomous weapons. Degtyarev has developed a tank called Nerekhta, that is supposed to “navigate autonomously to a target in silent mode and then explode with a powerful force to destroy other tanks or entire buildings” (Sharkey).
China

China is sending mixed messages with its view on LAWS. On one hand, the Chinese government joined a group of 28 countries that support a ban on LAWS (Chan). But, simultaneously, the government says that the further development of LAWS should not be terminated. In order to make faster progress in the sector, the Chinese President, “Xi Jinping has called for the country to become a world leader in AI by 2030”, by creating ties between the People's Liberation Army and the “private sector” (Chan). The People's Liberation Army has expressed plans to create A.I. powered, autonomous, “new types of combat forces” (Chan). Reports have shown that China's Army is “building unmanned submarines that would be capable of carrying out kamikaze attacks on enemy vessels” (Delcker, “How Killer Robots...”). The submarines are expected to be launched as early as 2020, with the main goal of patrolling the seas and “challenge the advantageous position established by Western naval powers” (Chen). The Chinese government has also been working on “stealth drones” called “Ziyan's Blowfish A2”, which should be able to detect targets and attack them (Gronlund).

Israel

In the past, Israel “was one of the first countries to “reveal that it has deployed fully automated robots: self-driving military vehicles to patrol the border with the Palestinian-governed Gaza Strip”” (Gronlund). Today, Israel's development of A.I. in the military is increasing, and so do the autonomous weapons. Israel has developed the first autonomous drones called “Harpy airborne anti-radiation drone” or “IAI Harpy” for short (Klare and politico). These drones have been used by the Israeli army “since the 1990s” and their purpose is to survey the battlefield “for hours” until autonomously tracking and “attacking an enemy's radar” (Delcker, “How Killer Robots...”). Various technological Israeli private companies such as “IAI, Elbit, and Rafael” have also taken on the development of LAWS (Rohrlch).

Campaign to Stop Killer Robots

The Campaign to Stop Killer Robots was formed in October 2012, and is a “coalition of 129 international, regional, and national non-governmental organizations (NGOs) in 60 countries” (“A GROWING GLOBAL COALITION.”). The organization believes that if robots were to start deciding who to kill, “a moral threshold” would be crossed. On its official website, the organization calls out the “US, China, Israel, South Korea, Russia, and the UK” on developing LAWS and says they must be stopped. Thus, the main goal of the Campaign to Stop Killer Robots is to establish an international ban on LAWS that will prohibit using them in war and being further developed. To achieve that, not only governments, but also technology companies have to pledge to not develop LAWS (“The Threat of Fully Autonomous Weapons.”).
Human Rights Watch

Human Rights Watch is another NGO that is strongly against LAWS and calls for their ban. The NGO argues that machines do not have the humanity and ethical knowledge required to kill a human being with dignity. HRW believes that sacrificing another human's life without a reason is not ethically and morally correct, and that such instinct is deep down in each person's brain, as that has been taught to them since childhood. Meanwhile, machines don't have that empathy: “they could not be pre-programmed to deal with every possible scenario in accordance with accepted legal and ethical norms” (Docherty). In order to prove that the general public is against autonomous weapons, HRW conducted a survey across 26 countries asking adults their view on LAWS. The results showed that 61% of adults that were used for that survey did not support LAWS (Evans, “Lethal Autonomous Weapons ...”). Furthermore, the Human Rights Watch says that LAWS go against the Martens Clause. Thus, the only way to follow the Martens Clause is to ban and stop the development of all autonomous weapons (Docherty).

Private Companies

Along with governments, the private sector is also starting to invest in the development of autonomous weapons, and more importantly, the artificial intelligence that LAWS will require. However, companies that have started working on such projects have faced serious backlash from NGOs such as the Campaign Against Killer Robots and even its own employees. For instance, in June 2018, Google employees signed a petition for the company to stop working with the Department of Defense on a project called “Project Maven.” The projects consisted of the development of A.I. that can analyze drone pictures. The Google employees feared that the technology from this project could later be used in A.I. and other parts of LAWS. After such pressure from its employees and other companies around the world, Google terminated their contract with Project Maven, stating that in the future they are not going to “design or deploy AI … [for] technologies that cause or are likely to cause overall harm.” (Evans, “Lethal Autonomous Weapons...”). Yet, even though Google stopped working with the U.S. military, other companies, including Amazon and Microsoft have continued working with the government in that sector (Gronlund).

United Kingdom

Along with the U.S. and Russia, the UK believes that a ban on LAWS would be unreasonable. The United Kingdom has stated that any autonomous system should always supervised by a human, and that the human operating the machine will always be held accountable (Gronlund). The government has stated that any war scenario needs “a combination of human and machines” efforts: “computers are
vital for (..) assimilation and processing of huge amounts of data (…) humans are vital for understanding context and evaluating consequences” (Kayser). As for the development of LAWS, the U.K. is planning on using “drone squadrons in combat by the end of this year” (Delcker, “How Killer Robots…”). Furthermore, the UK Military of Defence is investing in artificial intelligence and autonomation. Like many other militaries around the world, the UK is cooperating with the private sector, in this case with a company called Blue Bear Systems that is helping the government develop cheap drones to use in combat (Gronlund).

**Convention on Certain Conventional Weapons (CCW)**

The Convention on Certain Conventional Weapons can be described as striving “to protect military troops from inhumane injuries and prevent noncombatants from accidentally being wounded or killed by certain types of arms” (Abramson). It was founded originally in 1980 by 51 states, and has grown to 125 states (Abramson and “Autonomous Weapons That…”). Currently, the CCW has 5 protocols implemented. In order to add a new protocol, all parties in the Convention must vote for it, otherwise the protocol does not pass. However, a protocol becomes legal only when a country ratifies it (Abramson). The parties that have signed the CCW have created a Group of Governmental Experts (GGE) to discuss issues associated with new weapon systems and their dangers (Klare). Over the past six years, one of the main concerns of the GGE has been the issue of LAWS (Liu). However, the group has not been able to reach a consensus. Major supporters of LAWS such as the United States, China, and Russia, tend to block any possibilities of a ban on LAWS in the group.

**Netherlands**

The Netherlands believes that all autonomous weapons must remain under human control, with humans making the final decisions on launching an attack suggested by the weapon. The country stated that a team of humans must “decide, based upon the assessment of the operational context and other factors, whether deployment (…) is allowed under international law.” The Netherlands said that no weapons must have the ability to change their own goals, because that will make them fully autonomous. To ensure human involvement in the whole procedure of the weapon, the machine must be designed with human supervision in mind, “so that the operator understands the systems behavior” (Kayser). The country emphasizes the testing of autonomous weapons, and how extensive it must be before the deployment of the weapon into a real world situation. However, the Netherlands believes that there are many advantages to LAWS, such as the reduction of human deaths due to the system's fast responses to situations.
Timeline of Events

<table>
<thead>
<tr>
<th>Date</th>
<th>Description of event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1914</td>
<td>During WWI, the world saw the first emergence of autonomously controlled weapons. These weapons included “small, remote-controlled and tracked, disposable explosive devices.” Unarmed Aerial Vehicles were also first deployed during WWI. They were “controlled by radio” and “launched from a catapult” (Mcfadden). Throughout the 1930s-1940s, the Soviet Army started developing autonomous tanks called “Teletank,” in order to reduce the number of soldiers dying in combat. The tanks were controlled by radio. The Soviets deployed the Teletanks during their war with Finland (Mcfadden).</td>
</tr>
<tr>
<td>1930s</td>
<td>During World War II, the German Army created the FX-1400, a bomb deployed by a drone, being the first “radio-controlled drones” (McCormick). The German Army also released the Leichter Ladungsträger Goliath, which was the most successful of the autonomous weapons of that age. The Goliath was a “remote-controlled German tracked mine that looked like a baby tank” (Mcfadden). These proved to be very effective for the German Army, as they would destroy other enemy’s tanks completely.</td>
</tr>
<tr>
<td>1942</td>
<td>South Korea announces the incorporation of Samsung’s “Techwin SGR-A1 sentry robots” along the North Korean border. These robots have the ability to select targets and attack them from machine guns (McCormick).</td>
</tr>
<tr>
<td>September 2006</td>
<td>Documents in the “British Parliament reveal that the” British Army has been testing an autonomous Taranis drone that can identify and attack targets by itself in the Australian outback (McCormick).</td>
</tr>
</tbody>
</table>

Relevant UN Treaties and Events


As mentioned above, the Convention on Certain Conventional Weapons has five protocols to this day. The First Protocol bans the use of weapons that attack the enemy with small, “Non-detectable Fragments.” These fragments are dangerous as they are not seen on an x-ray and prevent doctors from successfully healing the patient. The Second Protocol is about “Landmines, Booby-Traps, and Other Devices.” This protocol places regulations on “the use of landmines and booby-traps,” such as
manufacturing them “equipped with self-destruct and self-deactivation mechanisms.” The Third Protocol, on “Incendiary Weapons,” manages the use of weapons that are used to “set fire” to a target. The Fourth Protocol bans the “use of lasers specifically designed to cause permanent blindness.” Finally, the latest, Fifth Protocol, states that all governments must clear known areas with left over “explosive remnants of war” in order to reduce the harm it causes to civilians by unexpectedly exploding (Abramson).

**Humanitarian benefits of emerging technologies in the area of lethal autonomous weapon systems, submitted by the United States of America, 28 March 2018 (CCW/GGE.1/2018/WP.4)**

This resolution was submitted to the CCW by the United States of America. It emphasizes how the development and use of LAWS in combat can decrease the number of IHL violations. The USA argues that A.I. and LAWS will decrease the number of human deaths in combat as the machines systems act with more accuracy than humans.

**Autonomy in weapon systems, submitted by the United States of America, 10 November 2017 (CCW/GGE.1/2017/WP.6)**

Another working paper submitted by the United States of America to the CCW. The key points of the paper include Explainable A.I., the legal implementation of the IHL into autonomous systems, and the “sound development” and “rigorous testing” that LAWS have to go through before being deployed. The ideas of this specific resolution are further discussed in the next section.

**Examination of various dimensions of emerging technologies in the area of lethal autonomous weapons systems, in the context of the objectives and purposes of the Convention, submitted by the Netherlands, 9 October 2017 (CCW/GGE.1/2017/WP.2)**

This working paper submitted by the Netherlands to the CCW explores the country's opinion on the topic of lethal autonomous weapons in regards to its definition, the extent and “concept of meaningful human control,” and the requirement that all LAWS must follow international laws. The Netherlands stated in the paper that there must be a “working definition” of autonomous weapons that will make it easier for countries to discuss the topic and avoid “confusion.” However, the definition itself should not predetermine the outcome of the debate. In regards to meaningful human control, the paper argues that autonomous weapons will still be human controlled because of the humans that give it their instructions and program it, thus the IHL should apply to LAWS the same way it applies to other weapons. Finally, the Netherlands believes that developing fully autonomous weapons is not in any state's interests, “as states want to retain control over their weapons” (CCW/GGE.1/2017/WP.2).
For consideration by the Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS), submitted by France and Germany, 7 November 2017 (CCW/GGE.1/2017/WP.4)

A working paper that was submitted by France and Germany in the CCW that gained recognition due to the ideas that it proposes. The paper talks about a universal definition of LAWS, the creation of a code of conduct on autonomous weapons, and other regulations that should be put in place in order for LAWS to be safely developed. The content of this paper is further discussed in the next section.

Examination of various dimensions of emerging technologies in the area of lethal autonomous weapons systems, in the context of the objectives and purposes of the Convention, submitted by the Russian Federation, 10 November 2017 (CCW/GGE.1/2017/WP.8)

The Russian Federation shares its views on the discussions of lethal autonomous weapon systems held in the CCW and the progress they have made in this working paper. The Russian Federations starts off by restating their opinion that due to the limited number of “working samples” of LAWS, it is difficult to hold a productive discussion on the topic, and furthermore, establish any concrete bans. Then, the country states that even though it is important to develop a definition of autonomous weapons, Russia fears that it will be biased towards one of the sides of the debate. Lastly, the paper mentions that the GGE should review international laws such as the IHL and the Declaration of Human Rights, and to what extent these laws can be applied to autonomous weapon systems (CCW/GGE.1/2017/WP.8).

Previous Attempts to solve the Issue

Various Member States of the Group of Governmental Experts under the CCW have proposed solutions to the problem of LAWS through resolutions and working papers, that can be found in the section above. This includes the U.S., which has suggested in its working paper “Autonomy in weapon systems,” that under U.S. national law, all the weapons that are produced by the army have to follow both the national and international laws that the U.S. complies with. Thus, the United States argue that the American programmers and developers of autonomous weapons will have to follow the rules of IHL (Evans, “Too Early for...”). Other countries may impose similar legislations in order to promote the Laws of War in the development of LAWS.

As aforementioned, the United Kingdom believes that there must always be a human supervisor making the final decision for the autonomous weapon, and that humans should be held accountable in case of an IHL violation. In order to ensure that the human is held accountable, the UK has suggested implementing “an audible trail of the decision makers and a record of their assessments on the suitability of the system for use in a specific theatre” (Kayser). Thus, the autonomous weapon must be made to ensure that that the human operators understand its decisions and future actions.
In a resolution submitted to the Group of Governmental Experts, called “For consideration by the Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS),” Germany and France, along with other countries, have suggested the idea of a “code of conduct” that will lay out a universal definition of LAWS and general rules that countries should follow in relation to them. This could be a resolution that can be passed in the UNGA and agreed upon even by the supporters of LAWS. However, probably the most controversial point of the proposal by Germany and France was having a person always present during an autonomous weapon mission, and require the state to disable the weapon if that condition is not satisfied (Klare). This proposal was agreed upon by most of the European countries, but was rejected by the United States and China (Acheson).

In the same resolution, France and Germany suggested other ideas to the GGE. Firstly, states can “voluntarily” share information on LAWS, such as the scientific development, research, and policies. Secondly, states can invite other states to see “demonstrations of LAWS” that the country developed in a realistic environment in order to encourage global cooperation on LAWS. Lastly, another idea that the resolution suggests is “weapon review” of LAWS like any other weapon systems. The paper says that the review mechanisms should be decided by the states based on what is appropriate to LAWS (CCW/GGE.1/2017/WP.4).

The UN Secretary General, Antonio Guterres has urged A.I. researchers to restrict the development of LAWS on several occasions. During one of his speeches at the UN, he said that “machines with the power and discretion to take lives without human involvement are politically unacceptable, morally repugnant and should be prohibited by international law” (“Autonomous Weapons That...”). Furthermore, the Secretary General has also spoken about the issue at the Paris Peace Forum, uring the members to “Imagine the consequences of an autonomous system that could, by itself, target and attack human beings.” Then, he called upon “States to ban these weapons, which are politically unacceptable and morally repugnant” (Evans, “Lethal Autonomous Weapons...”). Nonetheless, the UN itself has not proposed any concrete solutions to the problem and has not even established an internationally recognized definition of LAWS.

Possible Solutions

For the opposers of LAWS, the best solution would be to create a new Protocol under the CCW that would ban “the development, deployment, or use of fully autonomous weapons systems” (Klare). However, as stated before, that comes with many issues, such as major world powers blocking any bans or agreements on the topic in the CCW.

In order to ensure that the A.I. in the machine will not turn into a “black box” and that the supervisors of the machine can understand what is happening at all times, scientists and developers of
the A.I. have suggested the idea of “Explainable A.I.” This way, the A.I. would tell the developers or the supervisors of the machines exactly what the algorithm and the system is thinking and the reasons behind its actions. If operators of the system see “traceable feedback on system status” and “provide clear procedures for trained operators to activate and deactivate systems,” then the process will become safer. It will also be easier to trace back the precise mistakes committed by the A.I. and understand the reasons behind it (Evans, “Too Early for...”). Furthermore, by studying explainable A.I. in closed systems, and seeing what it reacts to and prioritizes, it can be easier to tell what the A.I. will do in a complex real world situation (Salmanowitz). This will help to bridge the world of humans and A.I. mistakes and reduce both, as humans and robots will work together to see what each one of them is doing and how to improve.

Furthermore, A.I. needs to be collaborative, free, and open to all governments and societies. That will make sure that no government or company is developing A.I. that can potentially go out of hand. That can happen if researchers are conducting A.I. development in secret, when nobody outside of the system can correct any mistakes in the code (Piper).

From a more social movement stance, what has proven to work in the past with the example of Project Maven from Google and other instances, is that removing the scientists in charge of the development of the A.I. can restrict the governments from creating LAWS. In other words, having employees of big tech companies and important scientists refuse to work on the development of LAWS, will result in the loss of necessary workforce.

**Bibliography**


_Lawfare_, Lawfare, 31 Oct. 2019,


_Lawfare_, Lawfare, 31 Oct. 2019,


Gilbert, David. “Trump Says Not Attacking Iran Is a Show of Strength.” _Vice_, Vice NEWS, 18 Sept. 2019,

Gronlund, Kirsten. “State of AI: Artificial Intelligence, the Military and Increasingly Autonomous Weapons.”

_Future of Life Institute_, Future of Life Institute, 9 May 2019, futureoflife.org/2019/05/09/state-of-ai/.


A Guest Blogger. “Handful of Countries – Including the US and Russia – Hamper Discussions to Ban Killer Robots at UN.” _Future of Life Institute_, Future of Life Institute, 26 Nov. 2018,


“Lethal Autonomous Weapons Pledge.” _Future of Life Institute_, Future of Life Institute,
futureoflife.org/lethal-autonomous-weapons-pledge/?cn-reloaded=1.


