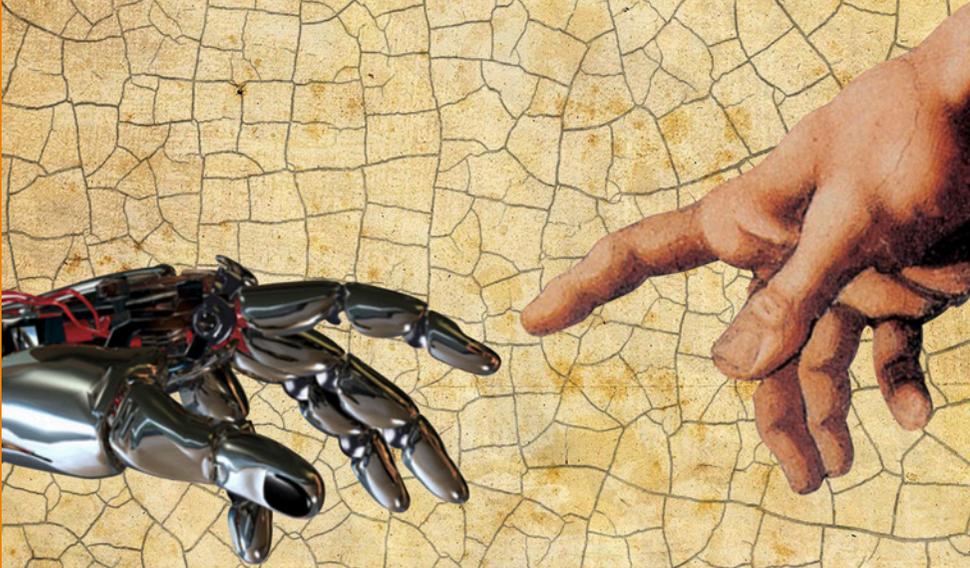


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The Ethical and Legal Implications of the Development and use of **Robotic and Autonomous Systems**

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This Food for Thought paper is a document that gives an initial reflection on the theme. The content is not reflecting the positions of the member states but consists of elements that can initiate and feed the discussions and analyses in the domain of the theme. All our studies are available on www.finabel.org

INTRODUCTION

Robotics is one of the fastest-developing fields of technology in the 21st century. Robots are more and more present in our lives, which can have both positive and negative consequences. The central question about robotics is how we can manage it so that human interests and robotic development align.

War has always been about human beings facing each other, with human lives being threatened on both sides. The ethical and legal rules governing war have been based on this notion. As robotic and autonomous systems take on a bigger role in warfare, it also becomes necessary to consider the issue of ethics with fresh eyes.

With armed drones, robotics has already reduced humans' physical presence on the battlefield, but humans have still operated the weapons systems. By contrast, with the emergence of autonomous weapons systems (AWS), human beings are not only physically but also psychologically removed from the battlefield, as the weapons can operate without any human intervention. AWS can

be described as autonomous robots that can independently seek and engage targets based on how the device has been pre-programmed (Crootof, 2015)¹. As of now, most military robotics, such as drones², are still closely dependent on human decision-making.

Fully autonomous weapons systems are yet to be deployed on the field, but the prospect of deployment is beginning to be a genuine possibility.

There are a number of reasons for the enthusiasm about AWS. Firstly, AWS may at least at first glance seem to eliminate the possibility of human mistakes, and an autonomous system can also more quickly engage targets than one operated by humans³. Moreover, by keeping soldiers away from the battlefield, AWS can reduce the number of casualties and improve efficiency. Nonetheless, the use of AWS invites ethical and legal considerations that should be addressed before the technologies begin to be used routinely.

This paper reviews the ethical and legal debate concerning the development and use of robot-

¹ Crootof Rebeca (2015), *The Killer Robots are here: Legal and Policy Implications*, 36 Cardozo L. Rev. 1837

² Jon Harper (2020), *98 Billion expected for Military Drone Market*, National Defense Website

³ Bhuta Nehal (2016), *Autonomous Weapons Systems: Law, Ethics, Policy*

ic and autonomous systems. The first section provides ethical perspectives on the subject, exploring consequentialist and deontological approaches in particular. The second section discusses current developments in AWS and efforts at international regulation. In turn, the third section considers what principles

of international law apply to this field in the absence of a specific convention concerning AWS. Finally, the fourth section reviews debates on the compatibility of AWS with international humanitarian law and offers perspectives on future efforts to jointly coordinate regulation on autonomous weapons systems.

THE ETHICAL DEBATE ON MILITARY ROBOTS AND AUTONOMOUS WEAPONS SYSTEMS

Law and ethics are ineludible linked. As the main goal of the international humanitarian law (IHL, also known as the law of armed conflict) and the international human rights law (IHRL) is to offer protection to persons, the relationship between ethics and law offers insights concerning the influence of public conscience on the evolution of legal provisions (International Committee of the Red Cross, 2018: 5). Every regulation of an act of warfare begins with an ethical evaluation of what is right and what is wrong. Thus, the limitations to legal rules take the shape of ethical perceptions of the society. Even if societal perceptions change over time, some conventional principles in warfare will never fade as in the case of poisoning or the deliberate killing of noncombatants.

The continuous development of the artificial intelligence (AI) has furthered its potential in the field of warfare, with possible applications including robotic assassination and mobile-robotic-improvised explosive devices, as well as lethal autonomous weapons (European Parliament Research Service, 2020: IV). Discussions on the latest technologies of warfare and AWS go beyond issues of legal compliance, as ethical concerns surpass the current legal boundaries of IHL and IHRL (Red Cross, 2018: 5). The main ethical arguments regarding the use of AWS can be divided into the consequentialist approach, which focuses on the actual results,

and the deontological approach, which instead focuses on the whole process.

The consequentialist approach

Emotions, humans' finite cognitive capacities, temporal constraints and other limitations make human beings unpredictable. Proponents of the consequentialist perspective may, therefore, argue that the AWS' superior ability to accurately identify and engage a target will considerably decrease civilian casualties in future conflicts, and is thus a positive development.

Precision and reliability

One of the main arguments in favour of AWS is their increased level of precision and reliability compared to human-operated devices, which would decrease civilian casualties thus furthering peace stability and reducing incentives of starting a war (Arkin, 2013; Convention on Certain Conventional Weapons (CCW), 2017: 5). However, it must be noted that the precision and reliability level of an AWS depends very much on the specific platform and how it is used. (Red Cross, 2018: 8).

Nonetheless, autonomous systems can be viewed as more reliable than humans for various reasons. Firstly, AWS have the ability to

act “fearlessly”, as they can be programmed to “self-sacrifice” (Belk, 2020: 7). In addition to this, AWS lack emotions which could bias their decision-making (ibid.). Thirdly, the superior information assessment and observation faculties of AWS enable them to operate more quickly and smoothly on the battlefield than humans could. Indeed, robotic sensors are already very sophisticated and exceed human capabilities. An autonomous system has a quicker reaction time than a human being does; furthermore, while a human requires rest, an autonomous system does not.

Proponents of the consequentialist view might suggest that with such precision, AWS would be able to act more conservatively on the battlefield since, unlike humans, they do not need to defend themselves. Nevertheless, even if the logic of this argument seems intuitive, it may not be realistic, given that the cost of AI devices makes preserving existing equipment an imperative.



Phalanx CIWS shooting

Diminishing risk

Moreover, as AWS do not need humans to control and direct them, soldiers are removed from the battlefield and therefore protected from harm (Red Cross, 2018: 9). In addition to physical harm, we should consider the psychological aspects. A significant percentage of soldiers who see combat suffer from post-traumatic stress disorder (PTSD). This

becomes a verdict rather than a diagnosis, which can make readjustment to civilian life almost impossible.

To this end, robots are meant to perform the hard and dangerous work that is difficult for humans to endure (Campa, 2019: 28). The non-emotionality of AWS will also give them full immunity to psychological exertion, ensuring they do not unload frustration, fear, fatigue, or anger onto their targets. Consequently, the elimination of human emotions can not only improve precision but also reduce the risk of wartime atrocities (Petman, 2017: 22).

The deontological approach

In an example of argumentation departing from the deontological perspective, Human Rights Watch (2016) highlights “the lack of human qualities necessary to make a moral decision, the threat to human dignity and the absence of moral agency” as dangers of AWS.

Human agency and the responsibility gap

There is a broad consensus that AWS lack Moral Human Control (MHC), which is vital for moral responsibility (European Commission, 2018: 10). The MHC principle has been endorsed by several parties of the Convention on Certain Conventional Weapons (CCW, Geneva) with the parties calling for the prohibition of AWS (ibid., 13-14). Accordingly, human agency is considered of utmost importance when it comes to military robots and AWS, since technology cannot be held responsible for destroying, injuring and killing targets while making “life-and-death” decisions (Kalmanowitz, 2016: 145; Red Cross, 2018: 9).

Since accountability and responsibility for decision-making cannot be shifted to AWS, there is a great risk of diffusion involved when it comes to moral responsibility. For instance,

in the United States, in the case of existing weapons systems, legal responsibility is taken by an operator authorizing the activation of the system (Red Cross, 2018: 11). However, one important factor is that a direct intent needs to be linked to the eventual consequences of the attack to impose moral responsibility to the operator. AWS generate complexity and ambiguity in this regard, as autonomous systems may select targets independently. Therefore, the commander activating the computer-driven machine will never know the place, the time, or the target of the attack, and consequently, there is no specific intent applied to a specific target. As a result, AWS risk blocking the process of assigning moral responsibility by removing the human intent from a specific attack. Despite the argument that AWS can operate more precisely and reliably than human beings, errors would be inevitable – in this case, the possibility of assigning responsibility would be particularly crucial.

All in all, AWS can be deemed to violate principles of international humanitarian law – the principles of proportionality, distinction, and military necessity – since autonomous systems cannot make conscious judgements to differentiate between civilians and combatants (European Parliament Research Service, 2020: 64-65; Sharkey, 2019: 76; Campa, 2019: 31).

Human dignity

When it comes to human dignity, one of the main arguments is the importance of how a person is killed or injured, as opposed to the simple *fact* of killing (Red Cross, 2018: 10; Heyns, 2017). Robots lack emotion, thus when attributed life-and-death decisions, human dignity can be undermined even in the case where someone represents a lawful target (European Parliament Research Service, 2020: 65).



Christof Heyns, the former UN Special Rapporteur on extrajudicial, summary or arbitrary executions, posits that by allowing machines to decide when and where to attack, humans become mere objects or targets used in digital scopes of programmed devices to apply force without considering any other solutions (Heyns, 2017). This illustrates that, in the deontological approach, results matter, but the process is even more important. Attributing military decision-making powers to AI-driven machines via algorithms and sensors puts humans out of the equation. It thus leads to the weakening of human agency decisions and the erosion of human dignity.

Emotional disengagement

Lastly, various studies conducted on semi-autonomous unmanned combat air vehicles (UCAV) pilots in the United States show a clear increase in *emotional disengagement* of remote pilots when using violence and lethal force (see Royakkers & Van Est, 2010). Many pilots have described the control panel of the semi-autonomous weapons systems as resembling a console, hence taking the mission as a video game (Singer, 2009: 308-309; Leveringhaus, 2017). This emotional disengagement, in turn, may lead to a lower threshold for deploying lethal force in the future (Lark, 2017: 68). Accordingly, if such a detachment is already observed with semi-autonomous weapon systems, the transition to fully autonomous systems could diminish the con-



rol over violence by causing disengagement on the part of the military and the society as a whole.

Concluding remarks

Law and ethics are ineluctably interconnected. AWS are expected to transcend human capabilities in their level of precision, reaction time, and impartiality. However, the disadvantages of the use of AI-devices in warfare considerably surpass the points in favour of their deployment since human agency plays a very important role. Allowing fully autonomous weapons systems to conduct missions could lead to unpredictable results to which solutions do not exist as of yet. With AWS precluding human control and accountability, many challenges will be raised in terms of legal implications of the use of such systems.

Hence, there is an increasingly urgent need to establish specific legal constraints on the use of AWS, given the rapid development of technology in this field. In the absence of such a treaty, IHL principles apply, which can lead to antagonistic consequences due to its “strategic adaptability” to contemporary warfare. The next section of the paper will expound on these matters in further detail.

DEVELOPMENTS IN AWS AND EFFORTS AT REGULATION

There is a real risk of a new arms race, akin to the one witnessed during the Cold War. Technological superiority is a key factor enabling states to assert their presence on the international scene. The current rapid developments in technology are occurring at a time when the rise of Chinese power presents a challenge to American hegemony, and Russia has returned to the international arena. Regulation will, therefore, be necessary to restrain the doctrines of these countries, including with regard to the robots and autonomous systems that are already in an operational state. However, agreeing on international rules concerning AWS currently appears difficult. This section first gives an overview of technological developments in AWS and then turns to the question of agreeing on international rules on the issue.

Existing technologies

As it stands, the beginnings of these robotic or autonomous weapons technologies are starting to be deployed. Even if officially, fully operational offensive autonomous weapons do not yet exist, automatic defensive systems are already in place.

An example of a defensive system is the South Korean SGR-A1 autonomous sentinel developed by Samsung TechWin (now Hanwha Aerospace), which, posted on the border with North Korea, can engage targets autonomously⁴. The United States has, for example, the Aegis naval defence systems, as well as the PATRIOT missile shield and even combat aircraft like the prototype X-47B⁵. Israel, another nation known for being at the forefront

⁴ Mary Wareham (2014), *Pourquoi doit-on interdire les robots tueurs*, Revue internationale et stratégique, Armand Colin p.97-106

⁵ Ibid.



SGR-AI

in the development of autonomous military technologies, possesses the HARPY drone model with the ability to fly, aim and autonomously destroy a target⁶.

For its part, Russia announced the development of a large-scale program creating robots for the battlefield and its first humanoid robot model FEDOR (Final Experimental Demonstration Object Research) in 2014⁷. This robot, which was originally designed for civilian purposes such as rescue operations or space missions, can also be used for military purposes even though that, after the spread of videos showing the FEDOR robot shooting, the former Defence and Space industry minister Dmitry Rogozin had to minimize this potentiality⁸. Russia is also producing and developing “unmanned” tanks like the Uran-9

model and the Nerekhta⁹. Even if we are still at the beginning of the rise of these technologies, the Russian Ministry of Defence says that it already has effectively and efficiently used these autonomous technologies at a joint exercise with Belarus during Zapad-2017 exercises¹⁰, and even in the Syrian war. In May 2018, the Russian military said that “in Syria, the Uran-6 robotic systems designed for mine clearing, and the Uran-9 multifunctional reconnaissance and fire support complexes of units on the battlefield have proven themselves well” (RIA Novosti, 2018).¹¹



Uran-9

Most of the systems deployed today are considered semi-autonomous in terms of human action in their use. If we exclude the fact that the code of an autonomous system will normally always be written by a human, we can distinguish three kinds of possibilities for human intervention in the action loop of a sys-

⁶ Ibid.

⁷ Lyudmila Alexandrova (2014), *Russia creating combatant androids of Avatar type*, TASS news agency

⁸ Aatif Sulleyman (2017), *Robot being trained to shoot guns “is not a terminator”, insists Russian deputy Prime Minister*, The Independent UK

⁹ Patrick Tucker (2017), *Russia Says it will field a robot tank that outperforms humans*, Defense one November 8, 2017

¹⁰ Ibid.

¹¹ RIA Novosti (2018), *Most of the equipment for the victory parade has passed tests in Syria*, Interview with the Russian Ministry of Defence on May 6, 2018 about the “Victory Parade”

tem. The human can intervene “in the loop” or “on the loop”, or the human can be “out of the loop”. In the first situation, the human would be in the weapon’s chain of command and thus validate the targeting, or the action of firing. In the second situation, the human is outside this chain of command and only has a surveillance role; he can still intervene at any time if the robot’s or the system’s actions do not seem to meet the expectations. The third situation concerns fully autonomous weapons systems. Once the system is deployed, it will fulfil its missions without any further human intervention.

This multitude of possibilities leads to a multitude of doctrines on this matter. Thus, political and strategic choices will influence choices between distinct models. For example, the United Kingdom is positioning itself for the presence of a human in the chain of command of weapons systems, while Russia advocates for more autonomy in the weapons¹² – the differing views of leading players are explained in further detail below. A real race is ongoing for the development of new robotic and autonomous weapons systems, in a context where ideological divergences on the subject are emerging on the international scene.

The difficulty of agreeing on international regulation

While AWS are developing rapidly, many voices have been raised against the development of such technologies. As explained in the previous section, there are ethical arguments against AWS, which has nurtured calls for a

total ban on these systems. The “Campaign to Stop Killer Robots” (CSKR) says that 30 countries and over a hundred non-governmental organisations support a ban on fully autonomous weapons (Campaign to Stop Killer Robots, 2020). Moreover, the European Parliament has in 2014 and 2018 adopted resolutions advocating a ban on the use of such weapons (European Parliament, 2014; European Parliament, 2018).^{13,14} A 2019 poll commissioned by the CSKR showed that 73% of respondents in ten European countries supported their country “working towards a ban on lethal autonomous weapon systems” (Human Rights Watch, 2019).¹⁵

However, among the countries supporting a ban, there is an obvious absence of world leaders in the development of such technologies (see Campaign to Stop Killer Robots, 2019). It is important to note that while China claims to support a ban for the use of autonomous robots and armaments, it still maintains the capability of developing and producing them – a point to which we will return below. The November 2019 meeting of member countries to the Convention on Conventional Weapons did not yield a binding uniform approach to regulating lethal autonomous weapons, and it was decided that negotiations would continue over the next two years (Brzozowski, 2019).

While some international actors support banning the technologies altogether, among the countries leading in the development of AWS, there are diverse doctrines and ideas about what types of systems should be developed. This fragmentation is hindering the negotiation and implementation of international reg-

¹² Noel Sharkey (2018), *Killer robots from Russia without love*, Forbes November 28, 2018

¹³ European Parliament resolution n°2014/2567 point I)-2)-d); adopted on 27-02-2014

¹⁴ European Parliament resolution of 12 September 2018 on autonomous weapon systems (2018/2752(RSP))

¹⁵ Alexandra Brzozowski, (2019), *No Progress in UN Talks on Regulation Lethal Autonomous Weapons*, Euractiv website



ulation on robots and autonomous weapons systems. Indeed, if even a single country with sufficient technological and financial means refuses to sign a convention regulating these armaments, out of concern for preserving their domination in the field, other players will in effect be blocked from agreeing on meaningful international regulation. The potential of autonomous weapon systems and robots is so strong that none of the major nations will accept being left behind. Thus, it is necessary to discuss the views of the countries leading the development of AWS.

The United Kingdom's approach has focused on the development of weapons where humans are "in" or "on the loop". In March 2019, a British Ministry of Defence spokesperson said that the UK "does not possess fully autonomous weapon systems and has no intention of developing them" (Gayle, 2019). However, according to the official, the

UK considers a pre-emptive ban "premature as there is still no international agreement on the characteristics of lethal autonomous weapons" (ibid.).¹⁶ At the same time, the UK possesses systems such as the fire-and-forget missiles developed by Brimstone that have self-guidance capacity and only require a human presence at the moment of launch¹⁷.

On the contrary, Russia and Israel are in favour of the development of fully autonomous weapons technologies. The Russian position was affirmed in a speech by President Vladimir Putin in 2015, where he expressed a desire "to exclude man from the immediate confrontation zone". Russia also opposes "any prohibition, moratorium or regulation on autonomous weapons". The Israeli position is to support further in-depth discussions about a possible regulation, but such discussions should not hamper progress in civilian research, development and use of autonomous technologies. Insisting on the

¹⁶ Gayle Damien (2019), *UK, US, and Russia among those opposing killer robot ban*, The Guardian UK

¹⁷ MBDA report (2019), *MBDA conducts first Brimstone 3 firing*, MBDA website

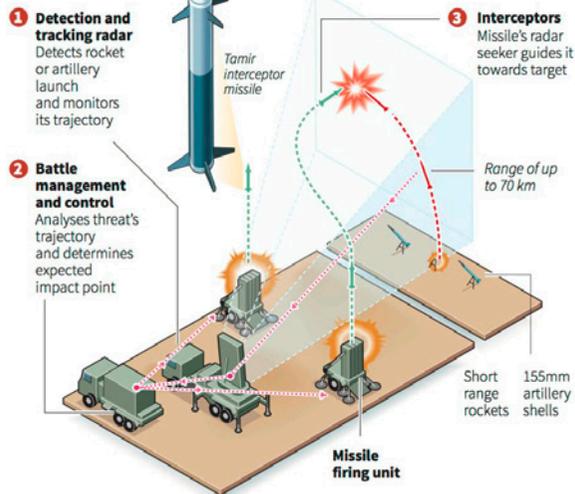
potential military and humanitarian advantages such as a better precision of targeting¹⁸, Israel is one of the major nations in terms of AI military technologies with successful weapon systems such as the Iron Dome.

In U.S. Doctrine, the orientation is in favour of the development of autonomous weapon systems. The 2012 Department of Defense Directive (DODD) 3000.09 requires that all systems including autonomous weapon systems be designed to “allow the commander and operators to exercise the appropriate level of human judgement over the use of the force”. What at first seems to suggest manual human control is only requires that humans will be involved in decisions about how, when, where and why the weapon will be used. Thus, the flexibility of this directive allows the development and use of autonomous weapon systems¹⁹. Since 2014, the United States has participated in international discussions of lethal autonomous weapon systems under the auspices of the United Nations Convention on Certain Conventional Weapons. But the US government does not currently support a pre-emptive ban on these weapons arguing humanitarian benefits with

Israel’s Iron Dome

The Jewish state’s anti-missile defense system is playing an increasingly important role in their escalating battle with Gaza-based militants

HOW IT WORKS



NETWORK DEPLOYMENT

- 2011 Iron Dome** - Short range rocket and artillery defense system
- 2013 David's Sling** - Interceptor system for medium- to long-range rockets and cruise missiles at ranges from 40 km to 300 km
- 2014-2015 Arrow III** - Upgrade to Arrow family of missiles would enable interception of targets at altitudes of over 100 km

Source: Rafiel, Israeli Defence Forces, media reports

more precise and efficient weapons.²⁰ The United-States appear as the major nation in the development of autonomous weapon system, this superiority can be explained by the vast pool of AI companies (2028 against 1 011 for China or 859 for the EU²¹) and the \$4.6 billion for unmanned or AI systems in the 2020 budget²².

¹⁸ Ofer Moreno (2018), Director, Arms Control Department, Strategic Affairs Division, Ministry of Foreign Affairs, p. 2, at UN GGE Meeting on LAWS, Convention on Certain Conventional Weapons, August 29, 2018

¹⁹ Congressional Research Service (2019) *Defense Primer: U.S Policy on Lethal Autonomous Weapon Systems*, updates December 19, 2019

²⁰ White paper submitted by the United States of America to the Groupe of Governmental Experts of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, *Humanitarian benefits of emerging technologies in the area of lethal autonomous weapon systems*, 28 march 2018

²¹ Data estimation from CISTP on the year 2019

²² Michael Klare (2019), *Pentagon Asks More for Autonomous Weapons*, Arms Control Association, April 2019



IN THE ABSENCE OF A TREATY: INTERNATIONAL PROVISIONS ON THE USE OF AWS

In the absence of specific convention circumscribing the development and the use of AWS, the door seems opened for these weapons. As we saw, due to the divergences on the international scene, the idea of a specific convention prohibiting such weapons seems utopian, but we will also see that some existing texts may restrict them. Also, it will be essential to recall that another juridical problem lies in the development of AWS, the user's liability.

China appears to be showing interest in the prohibition of AWS, but its approach is contradictory. The Campaign to Stop Killer Robots (2019) says that the country wants to “ban the use of fully autonomous weapons, but not their development or production”. China participates in the annual UN meeting on autonomous armaments, but it has faced criticism for its non-cooperative approach. In 2019, the specialist commentator Peter W. Singer said China is “simultaneously working on the technology while trying to use international law as a limit against their competitors” (Chan, 2019). The Chinese position appears consistent with the country's stated goal to take advantage of the “ongoing military revolution [...] centred on information technology and intelligent technology”, as articulated by the Deputy Director of the General Office of China's Central Military Commission, Major General Ding Xiangrong in 2018.²³

In brief, major world powers oppose binding international rules on AWS. In the absence of provisions specifically concerning robots and AWS, it is the existing law of war and international humanitarian law that applies. However, this legislation has various limitations, as will be discussed in the next section.

The lack of an international convention

Given the major world powers' positions, in our view, it is unlikely that international legislation prohibiting the use of robots and autonomous weapons systems will emerge, despite the annual meetings in Geneva where restrictions are discussed. From an informal meeting of experts in 2013, the High Contracting Parties to the Geneva Convention decided to establish a Group of Governmental Experts (CGE) in 2016²⁴. However, looking at examples of weapons that have been banned, we will briefly discuss how an agreement on a ban could be achieved.

The Convention on Certain Conventional Weapons, entering into force in 1983, prohibited the development and use of certain weapons considered too damaging or non-discriminatory, such as incendiary weapons. The Convention was particularly successful at restricting weapons whose risk of collat-

²³ Michael T. Klare (2019), *AI arms race gains speed*, Arms control association website March 2019

²⁴ Report of the 2016 Informal Meeting of Experts on Lethal Autonomous Weapons Systems (LAWS), Geneva 12-16 December 2016

eral damage was considered to outweigh the tactical benefits.

If we refer to this basic objective of these protocols, a parallel can perhaps be drawn with the development of robots and autonomous weapon systems. Indeed, at present, it is difficult to build an autonomous system with 100% reliability in view of the protection concerns of unarmed civilians or soldiers. However, the technological race continues nonetheless and, in the absence of specific texts framing their developments, robots and autonomous weapon systems are therefore regulated under the traditional law of war and humanitarian law.

Article 36 of the 1977 Additional Protocol I to the 1949 Geneva Conventions places restrictions on the development of new weapons: *“In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by this Protocol or by any other rule of international law applicable to the High Contracting Party”* (Additional Protocol I, 8 June 1977). It does not result in a ban on the development of new military technologies but rather a reminder of the obligation to monitor all the standards of the law of war by these new technologies, namely the principles of distinction, proportionality, precaution in the attack, the restriction of superfluous collateral damage, and respect for the rights of persons “hors de combat”. This obligation, which is intended to be as broad as possible, takes into account both specific and general circumstances in assessing compliance with international humanitarian law linked to the use of the new weapon.

However, Article 36 is essentially flawed, making the effective application of the principles of the law of armed conflict hypothetical. Indeed, it is established that it is the “High Contracting Party” which must determine whether or not a new weapon it is developing complies with the laws of war. Without additional methodological clarification, nor control over the implementation of the obligation of Article 36, the Article and the principles which it seeks to affirm, seem hollow. From one state to another, the intensity of controls will vary, and above all, the assessment will not be the same. This distortion will reinforce mistrust between countries developing robotics and autonomous weapons technologies and will facilitate the production of new weapons that bypass the legal considerations carried by Article 36.

The so-called Martens Clause links ethical considerations and international humanitarian law, which makes it relevant for questions raised by robots and AWS. In the absence of a convention or treaty, the Martens Clause – first introduced in the 1899 Hague Convention on the laws and customs of war – invokes “the principles of humanity” and “requirements of public conscience” to circumscribe the use of force. As such, it would come to restrict the military action of states, particularly by prohibiting methods of war which are not necessary to obtain a precise military advantage (Kwakwa, 1992: 36).²⁵ Therefore, this clause might be interpreted as restricting the development and use of robots and AWS. However, the Martens Clause currently has no coercive effect, and the International Court of Justice has been timid to give it a precise interpretation considering that the article 1, paragraph 2, of Additional Protocol I of 1977 was a modern version of it

²⁵ E. Kwakwa (1992), *The International Law of Armed Conflict: Personal and Material Fields of Application*, Kluwer Academic, Dordrecht, p. 36.

(see ICJ Advisory Opinion, 1996: 35).²⁶ The ICJ would probably not invoke the Martens Clause as a grounds for restricting the deployment of autonomous weapon systems if such a matter were to arise in the Court.

Thus, the traditional sovereigntist approach to international law prevents a real ban on the development of autonomous weapons under this clause. Moreover, a state can extricate itself from the appearance of a customary rule or slow down the implementation of a *lege feranda en lege lata* (the basis of a new law into an effective law), a fortiori, if it is one of the most powerful on the international scene and can influence the juridical debates. Furthermore, even if generally respected, positive international law is subject to challenge, and the law regulating war even more because of its nature. Indeed, respect for international laws is never more threatened than when the situation faced by States pushes them to react because of a danger. For example, Article 51 of the United Nations' Charter instituting self-defence for states has been abused in recent years during the fight against terrorism and by the propensity of states to strike these non-state actors in foreign territory without respecting the conditions present in the article 51²⁷. France thus began to preventively strike on ISIL in Syria on September 2015 without the Syrian government's consent and before the November's attacks potentially legitimating a motive of self-defence or the UN Security Council resolution n°2249 of November 2015 allowing the member-states to take action against ISIL²⁸. As the law professor

Franck Latty underlined it, “despite the legal framework provided by the representatives of the State, France seems to make the eradication of ISIL a priority prevailing over the scrupulous respect for the *jus contra bellum* in force”²⁹. We see here the whole limit of international law which ultimately depends on the will of the States.

Nonetheless, the Martens Clause raises some questions on the taking into account of natural law, with moral rules restricting the development of certain weapons. The clause reinforces this questioning since it indicates that the law of armed conflict offers not only a code of positive rights but also a moral code (Ticehurst, 1997).³⁰ Such a development would thus give voice to the opinions of the smallest states and allow them to influence the development of the law of armed conflict. It seems essential that the development of international provisions on AWS reflect the views of the entire international community and, as we have seen previously, many states are even calling for a ban on robots and autonomous weapons systems. However, the above discussion reveals that the current legal provisions offer little in the way of restrictions for the major powers developing autonomous weapon systems.

The question of the user's liability

Another legal issue relates to responsibility in the event of a breach of the principles of armed conflict mentioned in the above sec-

²⁶ ICJ Advisory Opinion July 8, 1996, *lawfulness of the use of nuclear weapons by a state in an armed conflict*

²⁷ Rein Mullerson (2020), *Self-defence against Armed Attacks by non-state actors*, Oxford University Press

²⁸ United Nations Security Council, resolution n°2249, 20 November 2015

²⁹ Professor Frank Latty (2016), *Le brouillage des repères du jus contra bellum, à propos de l'usage de la force par la France contre Daech*, Extract from the international public law review pf January/March 2016, editions A. Pedone, p.14

³⁰ Professor Rupert Ticehurst of King's College London (1997), *Martens' clause and armed conflict*

tion. In “out of the loop” autonomous systems, without a human operating the system, no-one is immediately responsible for having committed reprehensible acts. As Bonnie Docherty of Human Rights Watch, which advocates a ban on AWS, puts it, “no accountability means no deterrence of future crimes, no retribution for victims, no social condemnation of the responsible party” (Human Rights Watch, 2015).

Current international legal developments make state responsibility a necessity to condemn violations of international humanitarian law. Thus, if its armed forces violate IHL using a robot or an autonomous weapons system, the responsible state will have to answer for these acts. Alternatively, it is necessary to find the individuals involved in the programming or deployment of the weapons that led to the violation of the law. The problem is that the human who programmed or deployed the autonomous weapon may not have the knowledge or the intent that would be required for him to be held accountable.

Article 86§2 of Additional Protocol I to the 1949 Geneva Convention stipulates that superiors are not absolved from penal or disciplinary responsibility even if a breach was committed by a subordinate “if they knew, or had information which should have enabled them to conclude in the circumstances at the time, that he was committing or was going to commit such a breach and if they did not take all feasible measures within their power to prevent or repress the breach” (Additional Protocol I, 8 June 1997, article 86§2). In other words, the commander's responsibility is not always obvious. Still, the commander

must have sufficient information to conclude that the action of the subordinate was an offence.³¹

In addition, Article 87 of the same protocol also leaves a loophole in the conditions relating to the characterisation of the commander's responsibility considering strictly that his authority and his control over his troops is necessary to establish his responsibility. Such conditions, without further specification, allow for freedom in the assessment of control over the deployment of robots and AWS.



Harop drone

LEGAL IMPLICATIONS AND FUTURE DEVELOPMENTS

As explained above, it is well accepted that new technologies of warfare must abide by existing international law, in particular international humanitarian law. Whether or not a new weapon, such as an autonomous weapons system, complies with IHL is determined by assessing the weapon's foreseeable effects based on its design, and its foreseeable use in normal or expected circumstances. The use of

³¹ Doctrine from the « Yamashita » case, United States Supreme Court of Justice 1946. Command responsibility retained for war crimes even if he did not command or authorize his troops but was aware of their behavior. Doctrine included in the Geneva Conventions, applied to trials of the International Criminal Tribunal for the former Yugoslavia and, since 2002, adopted by the International Criminal Court.

such a weapons system would need to comply with the fundamental rules of international humanitarian law (International Committee of the Red Cross, 2014: 76).³² Particular attention must be drawn to the most commonly identified difficulties with regard to introducing robotics in military systems, namely the issues regarding distinction, proportionality and precautions in attack, as well as the problem of accountability.

With these considerations in mind, there is no consensus regarding the appropriateness and legality of AWS. Opponents of AWS have argued that the systems cannot meet the requirements of international humanitarian law for protecting the lives of civilians, such as the principles of distinction and proportionality (see Heyns, 2014: 45). While opponents have asserted that the systems could be not only unsafe but also contrary to international law, some scholars have offered proposals for solving the legal issues that accompany these types of weapons.

Concerns and dilemmas

Ronald Arkin (2014) has argued that if AWS are introduced properly, they could guarantee a greater adherence to the laws of war than the use of soldiers can. Namely, autonomous systems should in his view be “properly inculcated with a moral ability to adhere to the laws of war”, and mainly be used “in narrow bounded military situations as adjuncts to human warfighters”. Arkin also calls for continuous scrutiny of the development and deployment of AWS to take place in international forums

like the United Nations to ensure compliance with international law.³³

For his part, Peter W. Singer (2009) has given proposals for addressing issues arising from the requirements of distinction, proportionality, and accountability. Regarding the requirement of distinction between civilians and combatants, he notes that a robot can be programmed to only shoot at targets that have fired at the robot first, thus reducing danger to civilians; however, he proposes that autonomous robots only be allowed to carry non-lethal weapons. Concerning the question of legal accountability, Singer proposes to ensure the programmers and commanders behind the systems can be held responsible. At the same time, regarding proportionality, he suggests the principle should apply to robots as it does to humans.³⁴ On the other hand, Christof Heyns (2014: 47) has emphasised that all states should have a duty to ensure that “meaningful human control” is exercised each time force is used, and that the international community should develop a definition for the concept of meaningful control, as well as guidelines for enforcing the principle in practice. Heyns (ibid.) writes that without such accountability, he would find AWS unlawful.

If a ban on fully autonomous systems were to be agreed, the legal consequence would be that these systems are grouped alongside chemical and biological weapons, with the systems serving no legitimate military purpose. An armed unmanned system could be expected to circumvent this legal restriction if it remained under human control, with ac-

³² International Committee of the Red Cross, *Autonomous Weapon Systems: Technical, Military, Legal and Humanitarian Aspects, Expert Report*, 2014, p.76

³³ Ronald Arkin (2014), *Ethical restraint of lethal autonomous robotic systems: Requirements, research, and implications*, p.38

³⁴ Peter W. Singer (2019), *Military Robots and the Laws of War*

countability for targeting decisions ascribed solely to human targets. Otherwise, the consequences would be largely indistinguishable from those of the internal US Department of Defense Directive from 2012, which has prohibited the development and use of unsupervised lethally armed autonomous systems. Especially in a fast-developing field like AWS, it is noteworthy that international conventions do not change quickly: if an international convention were once agreed, the document would presumably serve as a permanent point of reference for a long time to come.³⁵

At present, besides the absence of international legal provisions concerning specifically AWS, the relevant domestic traditions of states vary. However, the US scholars Kenneth Anderson and Matthew Waxman (2012: 15-16) propose sharing best practices concerning internal norms within states, noting that a shared understanding of the guiding principles will facilitate joint operations, among other advantages. In the authors' view, the core principles would be drawn from the framework of customary international law, with due consideration of international humanitarian law. Lastly, it may be advantageous for the development of common understanding on the Autonomous Weapon Systems if the European countries review their domestic legislation and doctrines related to this subject and try to insure some level of harmonization. An international treaty might seem like a big step. However, soft law or smaller-scale agreements are something that can serve the purpose of coming to a more uniform understanding.

In conclusion, there is no global consensus regarding the introduction of fully autonomous weapons systems in the military. This does not come as a surprise, as both substantial

legal and ethical considerations are at stake, and many questions remain to be definitively answered. States must not make rash decisions without thoroughly examining the full scope of potential consequences for all parties: friendly forces, enemy combatants, civilians, and society at large. As we developed before, the current debates give voice to the States via the UN meetings, the public society via the campaigns such as the CSKR but they must also give an important voice to the military authorities as they will be the first impacted by such development. Military authorities, via their expertise, should raise the awareness of political decision-makers and advise them on the way in which the legislation on the use of autonomous systems should be established. In most Member-States, there is too little interaction between the military authorities and politics, which threatens to put us in a situation where there is a huge gap between the development of legislation and the possible use of autonomous weapons and its consequences on the field. A well-reasoned and comprehensive debate on the issues associated with AWS is necessary, and the general well-being of the civilians should remain the primary focus. Even though a binding international document on AWS appears unlikely, agreement on political recommendations and best practices between states seems more feasible.

³⁵ George R. Lucas, Jr. (2018), *Automated Warfare*, p.330

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