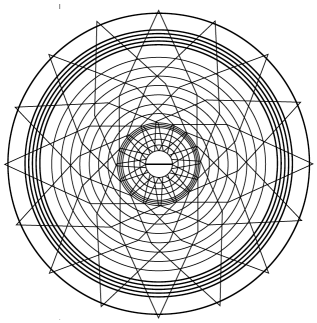

TERRORISM AND LETHAL ROBOT SYSTEMS: INTERNATIONAL SOCIETY BETWEEN THE END OF SCIENTIFIC RESEARCH AND THE END OF HUMANITY

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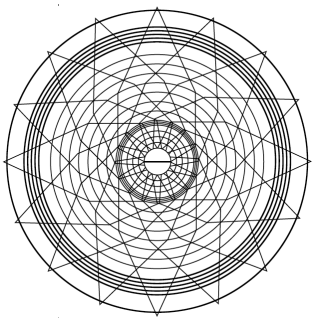
Abstract:

This article presents an initial discussion of scenarios linked to terrorism and lethal autonomous robot systems (LARS). LARS are a real risk to international security, and if a terrorist organization gains access to these new weapons, the most likely outcome is the end of humanity. This paper discusses two arguments: first, that LARS are different from nuclear weapons because all state and non-state actors can have access to them; and second, that technological progress goes faster than international law and diplomacy, which should ban or limit the use of LARS.
Considering the first argument, the article defines LARS and explains their different classifications and the specificities of these weapons that distinguish them from nuclear weapons and make them more dangerous.
Supporting the argument that the world is facing new threats, the article discusses different scenarios for the use of LARS by states and non-state actors as well as possible solutions for reducing the use of LARS and their risks. The paper also provides an overview of international law and the international mechanisms that necessitate a rethinking of the rules concerning the use of force. The conclusions of the article are that all debate concerning international law will not be enough to reduce the risks of possible terrorist use of LARS and that international society will have only two choices: to end research on artificial intelligence in the military field or to take the risk of ending humanity by supporting research in this area.

Keywords: Lethal Robot Systems, killer robots, terrorism and international law



Introduction

Artificial intelligence (AI) is seen at several levels in information technology and military uses, especially in lethal autonomous robot systems (LARS). The possible use of LARS by terrorists is the most important threat to humanity internationally, especially given that some states choose to use terrorists rather than state armies, as we have seen in Syria, Libya, and Yemen.

Since its appearance, terrorism has become a real threat to international security, and states have made great investments to bring it to an end. However, the threat is still increasing, even as states have used technological developments to produce more sophisticated arms. Terrorist organizations, as often as states, have used the new technologies in their crimes, which is not strange considering that some terrorist organizations are funded and supported by states. The most significant risk is that terrorists could have easy access to LARS.

The key questions which can guide us are:

Is it imaginable that states in possession of LARS could put them at the disposal of terrorists to use in war? Is it easy for terrorists to gain access to LARS?

States have already begun to wage war using terrorists in lieu of soldiers, funding them too with the most sophisticated arms, as in the wars in Syria, Libya, and Yemen, will AI end terrorism or offer it new technologies?

How will terrorists use AI? How will AI contribute to the spread of terrorism? How can terrorism be combated using AI? Are LARS used to fight terrorism? How can the international community limit the malicious use of AI, especially LARS? What are the choices and alternatives? What will warfare be like in the future? What are the challenges linked to international law? What are the implications for the balance of power pertaining to the malicious use of AI, especially the use of LARS by states and non-state actors?

Conceptual framework

Some of the keywords used in this article do not have a standard, universally accepted the definition, whether the term is old, such as “terrorism”, or new, such as “lethal autonomous weapons systems”. However, we will give a background to the key notions and present an understanding of the concepts to help answer our problems.

So that we do not become mired in debating precise definitions here, we provide a detailed discussion and justification for our definitions in Appendix A: Definitions.

1.1. Terrorism: definition and background

The first appearances of terrorism date back to ancient times in Pharaonic Egypt, Greece, and the Roman Empire, but what was known as terrorism in the past is not the same as terrorism today. The notion and phenomena have changed with the

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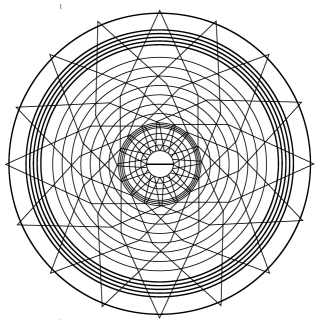


differences in political thought prevailing at each stage and with the progression of criminology and terrorists' goals, strategies, and tools.

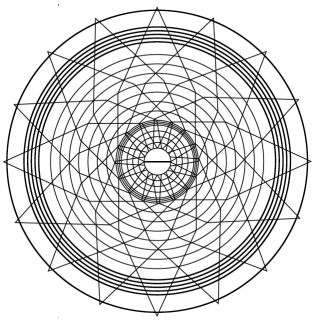
The first international attempt to define terrorism was made by the international community as early as 1937, when the League of Nations prepared a draft convention for the prevention and punishment of terrorism following the assassination of King Alexander of Yugoslavia. The draft convention defined terrorism as "all criminal acts directed against a State and intended or calculated to create a state of terror in the minds of particular persons or a group of persons or the general public" (Ruperez, 2006, p. 2).

Later, this definition served as a reference when the United Nations and regional intergovernmental organizations dealt with the issue from a legal and political perspective. International society has elaborated other mechanisms related to the prevention and suppression of international terrorism, such as the Tokyo Convention of 1963, the 1973 New York Convention on the Prevention and Punishment of Crimes against Internationally Protected Persons, including Diplomatic Agents, the Hague convention on hijacked aircraft of 1970,the regional agreement between European countries of 1977, an agreement between Arab states in 1998, and various resolutions of the General Assembly of the United Nations. The most important of these international mechanisms have been the formation of a special committee on terrorism, the declaration concerning procedures for the elimination of international terrorism, and various Security Council resolutions, notably concerning the case of the American hostages in Tehran.

The most recent mechanism dealing with terrorism has been the International Convention for the Suppression of Acts of Nuclear Terrorism, which was opened for signature on 14 September, 2005 (Ruperez, 2006). Despite this legal framework, there has been no agreement between jurists or states on a specific definition of terrorism because of differences in the views of states as well as of individuals.

The second paragraph of Article 1 of the 1998 Arab Convention on the Suppression of Terrorism gives the following definition of terrorism: "Any act of violence or threat, whatever its motives and purposes, that occurs in the implementation of an individual or collective criminal enterprise aimed at terrorizing or terrorizing people" (League of Arab States, 1998).

Terrorism has won more international attention than any other issue, especially since the events of September 11, 2001, when the world found "international terrorism" inducted to its vocabulary. This has become a basic term in the field of international relations a field that has never known the meaning of stability. In the recent past, war between countries was the dominant feature of international relations, but today it has been replaced by terrorism, and there are those who see terrorism as an alternative to traditional warfare, as in Syria. Nevertheless, terrorism has changed considerably. In the last decade, terrorists have benefited greatly from innovations in AI that appeared in the 1950s but are evolving very rapidly. With the invention of self-controlled machines such as driverless cars and drones, AI has become an integral part of public life.



1.2. LARS: Background and classifications

There are many definitions of LARS, but a widely used one is that given by the United States Department of Defence and Human Rights Watch, which has stated that the term lethal autonomous robotics (LARs) "refers to robotic weapon system that, once activated, can select engage targets without further intervention by a human operator" (Heyns, 2013). A range of other terms have been used to describe LARS and fully autonomous weapons, including "lethal autonomous weapons systems" and "killer robots" (Sharkey, 2012).

It is characteristic of robots that they sense, think, and act based on how they are programmed by a human (Lin, Bekey and Abney, 2008). This means that these powerful machines are autonomous and can select a target and use lethal force (Heyns, 2013). All robots possess autonomy, which, according to Lin, Bekey, and Abney, means they have the ability once activated to operate in a real-world environment without any form of external control or human supervision and, at least in some areas of operation, for extended periods of time. However, the exact degree of autonomy can differ widely. In general, Human Rights Watch classifies weapon robots into three categories according to their levels of autonomy:

• Human in the Loop Weapons: Robots which can select targets and deliver force only with a human command;

• Human on the Loop Weapons: Robots which can select targets and deliver force under the oversight of a human operator who can override the robot's actions;

• Human out of the Loop Weapons: Robots which are capable of selecting targets and delivering force without any human input or interaction (IHCR, 2012).

The US Department of Defense distinguishes between two major types of LARS: autonomous and semi-autonomous robots (US Department of Defense, 2007). Research in this field is still far from creating robots with total autonomy. In this context, the International Human Rights Clinic (IHRC) at Harvard Law School has argued that "fully autonomous weapons do not yet exist, but technology is moving in the direction of their development and precursors are already in use" (IHCR, 2012). Many countries are investing in LARS.

2. What Are the Future Scenarios?

Terrorist groups like *Daech* are using AI in three ways: first, to hack into information systems; second, to acquire new elements through social media; and third, to develop LARs against countries. *Daech*, which remain the most dangerous terrorist group on the international scene, have succeeded in investing in AI in Syria and Iraq. Terrorist groups are now using scientific and technological innovation and the digital space to achieve their malicious goals. AI gives terrorists access to information, which they use in their operations against countries. Two years ago, a booby-trapped drone

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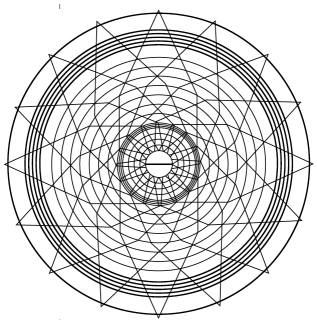


launched by *Daech* militants killed two Peshmerga fighters and wounded two French soldiers north of the ISIS controlled city of Mosul, French and Kurdish officials said (Reuters, 2016).

Daech sent small, very flexible drones armed with grenades, which enabled the Iraqi forces to skirmish in more than one place. They also used commercial drones converted into tiny bombers (Atherton, 2017).

In Tunisia, *Daech* were able to draw computer images of the geographical topography of the town of Ben Guerdane (south-east Tunisia) and carry out a simulation of reality before launching their attacks, either to avenge the policemen or to carry out new terrorist operations. This means that AI now relieves the burden for armed groups of obtaining information intelligence and paves the way for their operations.

Terrorists are also using AI in cyberspace for information penetration, which is disastrous. *Daech* have used AI to create a state of terror in people's hearts and subsequently pit ideologically led masses against individuals by publishing their names, phone numbers, and addresses.

Considering that terrorists have easy access to AI, especially LARs, dark scenarios, and terrorists will use this intelligence largely against countries. In the next few years, cybercrime will increase because advanced technologies and AI facilitate it for terrorists.

In the past ten years, Europe became a theatre when terrorists using some of these new technologies turned vehicles into weapons in France, Germany, and Britain, leaving dozens dead and wounded. The biggest threat according to Mikko Hyppönen, the chief research officer at F-Secure, is that terrorists could load a bomb onto a self-driving car, type in the address of their desired destination, and send it on its way. In this way, suicide bombers would no longer need to be recruited (Bigelow, 2016).

Considering the ability of hackers to penetrate the networks of state infrastructure from water and electricity systems to bridges and airports as well as the number of scientists acquired by terrorist organizations every year, countries should rethink international law to predict the malicious use of AI in the future by terrorists.They should also think about how to ensure the protection of satellite programs by assisting civil aviation in the international airspace and subsequently controlling the routes of the aircraft and directing them to where they want. If terrorists find a way to break into this program, it will be an unmitigated disaster. The question is, how can terrorist groups such as *Daech* have access to weapons, including LARS?

Here, we have two scenarios, the first of which is that countries sell weapons to organizations such as *Daech*, as we can see in Figure 1.

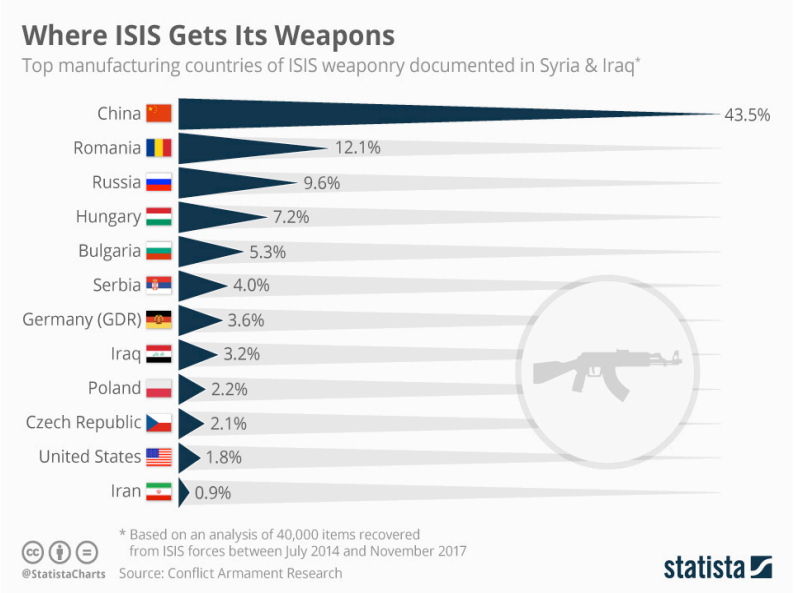


Figure 1. Top manufacturing countries of ISIS weaponry.

According to Niall McCarthy, the top manufacturing source of *Daech* weapons documented in Syria and Iraq was China with 43.5 percent, while Russia only accounted for 9.6 percent. Despite that, Russian weapons still outnumbered Chinese weapons in Syria, likely because Russia supplies forces loyal to the Assad regime. American weapons only accounted for 1.8 percent of the total documented (McCarthy, 2017).

According to the Washington Institute for Near Est Policy, *Daech* was the world's best funded group of terrorist (Figure 2).

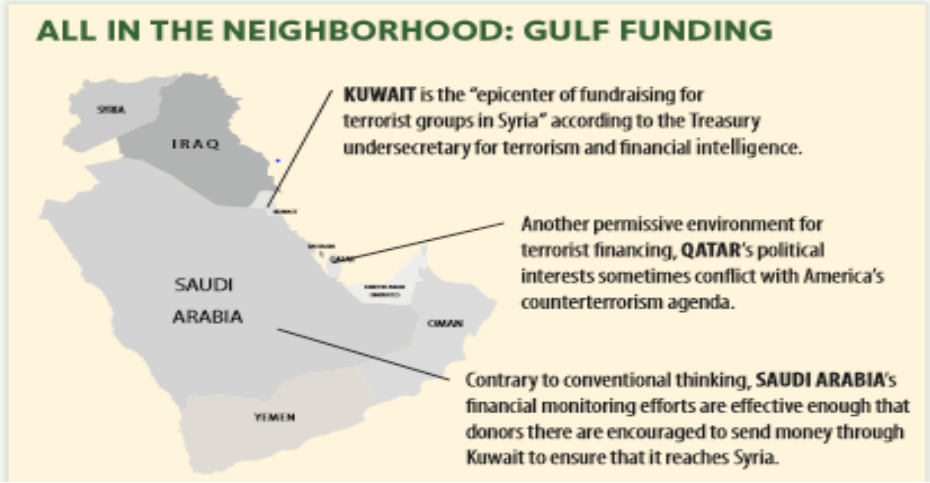
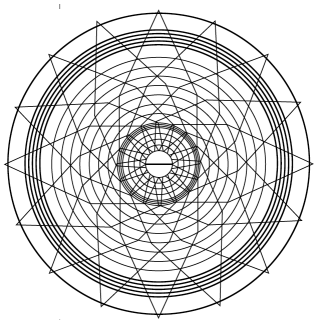


Figure 2. Terrorist financing from the neighboring countries. Source: Washington Institute for Near Est Policy



The second scenario is that *Daech*, for example, develop these new technologies themselves based on their human resources, considering the numbers of engineers among them and their access to the raw materials necessary for the creation of these weapons.

3. Trends in LARS and how they will impact international security

The use of LARS by terrorists will increase in the future for offensive or defensive goals because countries are also using these new weapons. Docherty wrote, "Most notably, the United States is coming close to producing the technology to make complete autonomy for robots a reality and has a strong interest in achieving this goal" (Docherty, 2012, p. 3). Several countries are investing in this field, including the United States, the UK, China, Israel, Russia, and South Korea (Figure 3). These six countries are known to be researching, developing, and testing fully autonomous weapons (World Economic Forum, 2016).

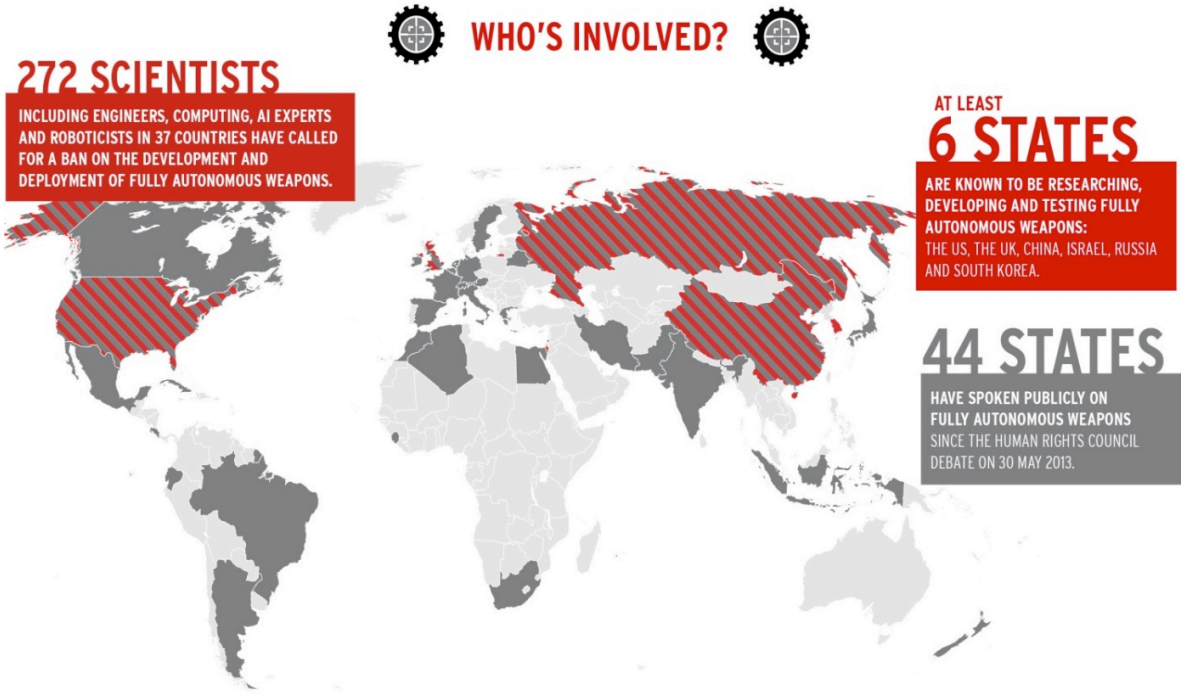


Figure 3. Investment in the field of autonomous weapons across the World. Source: World Economic Forum, 2016.

In September 2018, the research arm of the US military, the Defense Advanced Research Projects Agency (DARPA), announced that it is investing $2 billion into AI over the next five years. Canada, the UK, Russia, Israel, China, India, and France also are prioritizing AI, knowing that it is key to growing their economies. China has said it wants to be a global leader by 2030 (Stober, 2018). The market for LARS is increasing exponentially, and unit prices are falling significantly (Allen, Chan, 2017). According to

the Boston Consulting Group, between 2000 and 2015, worldwide spending on military robotics (narrowly defined as only unmanned vehicles) tripled from $2.4 billion to $7.5 billion, and it is expected to more than double again to $16.5 billion by the year 2025 (Sander, Wolfgang, 2014).

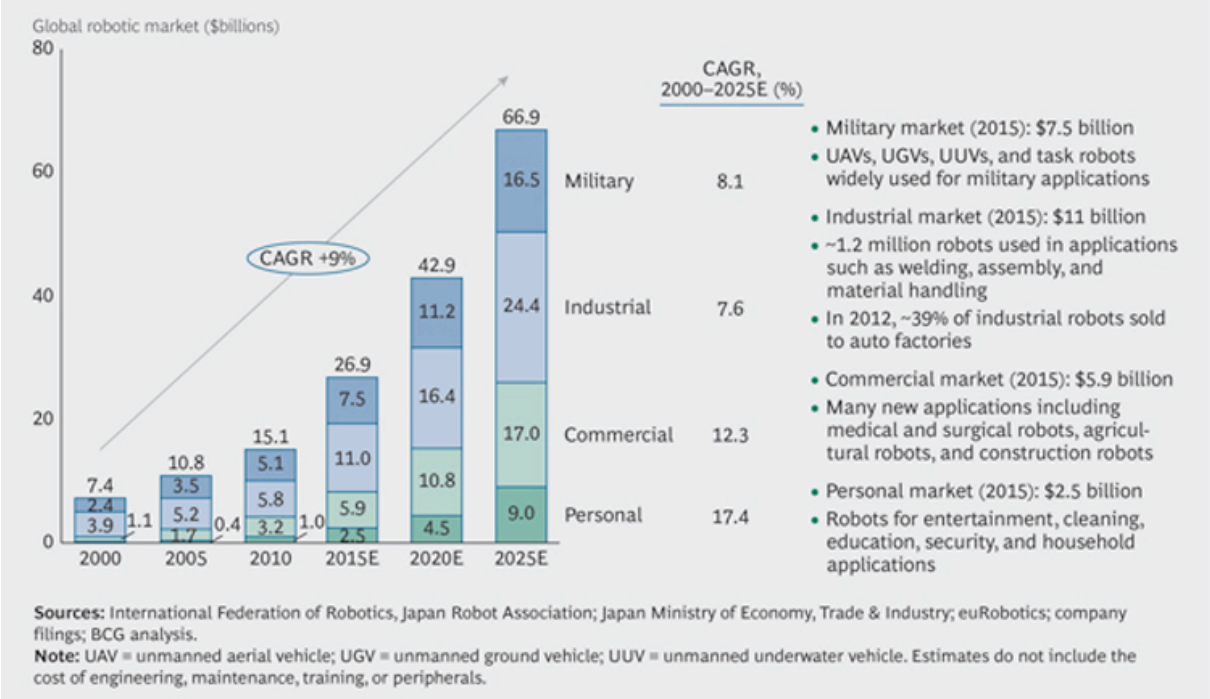


Figure 4: Worldwide Expenditure on Robotics is Expected 2025.

The growing military robot market gives an idea of future wars, which will be characterized by the widespread use of LARS by states and non-state actors. In fact, autonomous systems have been used in warfare since World War II, when the Norden bombsight and V-1 buzz bomb were used and computer systems were linked to sensors involved in the dynamic control and application of lethal force (Allen, Chan, 2017).

Therefore, the real threat to international security is the use of LARS by terrorist organizations. This is why civil society (researchers and policymakers, transnational corporations, international organizations, and NGOs) should work together to stave off this threat, which could end humanity. As a solution, some voices suggest banning LARS similarly to nuclear weapons, as it is unacceptable that humans should be killed by robots. This rationale means to them that they are fighting for an ethics issue linked to human rights. The most important initiative is an open letter addressed to the United Nations Convention about certain conventional weapons. The letter is written by companies building technologies in AI and robotics that may be repurposed to develop autonomous weapons; accordingly, they feel responsible for raising this alarm

(Future of Life Institute, 2017). The letter is a call for action to protect all from the danger of lethal autonomous weapons (Future of Life Institute, 2017).

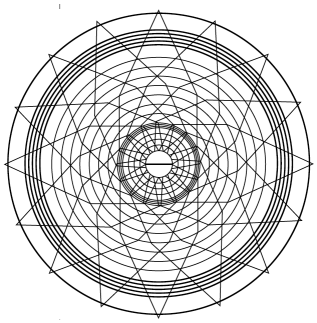
But is it possible for states which are establishing technological sovereignty to ban LARS? The growing investment in LARS can be explained as a fundamental characteristic of this new cold war which could have tangible and intangible impacts on the balance of power over this next decade.

In a sense, one of the most divided regions is the frontier between North and South Korea, which separates both countries and is called the Demilitarized Zone, because the South Korean arms manufacturer DoDamm used the Robot World 2010 convention to display its new Super aEgisII, an automated gun turret which can detect and lock onto human targets from kilometers away and deliver heavy firepower, at day or night and in any weather conditions (Blain, 2010).

Picture 1. DoDAMM's Super aEgisII: South Korea's autonomous robot gun turret. Source: Loz Blain, 2016.

Picture 2.DoDAMM's Super aEgisII: South Korea's autonomous robot gun turret. Source: Loz Blain, 2016.

The debate about the use of LARS should focus also on terrorism. Several countries use LARS against those who do not have access to this new army force, which is a violation of international law. For example, Obama used drones in Afghanistan, Yemen, and Libya, killing a number of people including civilians. This behaviour is a manipulation of international law and a violation of the rules concerning the use of force. It is a violation of the rules concerning the use of force. «116 founders of robotics and artificial intelligence companies from 26 countries released an open letter urging the United Nations to ban LARS or killer robots» (Ackerman, 2017). Lot of voices are calling for a new international treaty that would ban LARS (Linden, 2017).



So is banning LARS a good option? In reality, it is difficult to ban them because all countries and even terrorist organizations have access to the materials used in these technologies. This point of view is based on comparing LARS and nuclear weapons, but in fact, such a comparison is not possible because the materials used in both kinds of weapons are not the same. LARS requires knowledge as well as brands and some materials, which are easy to find in any developing or developed country.

Conclusion

As a result of this study, the discussion about LARS and terrorism brings us back to the old discussion concerning war and the use of force, this time to end the new threat imposed by LARS. Some suggest banning LARS. However, this is difficult because it leads us to rethink the purpose of creating arms. Is it to kill someone? Why should we kill someone by LARS or by conventional arms?

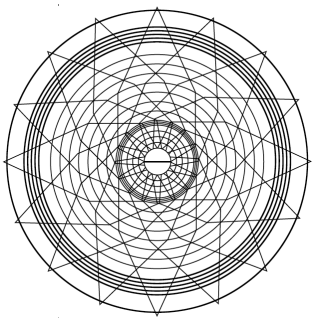
LARS are not yet fully autonomous, but we do not have total control over these new arms, which means there is a human responsibility. The question of responsibility leads us to a debate over emotions because, in the end, the goal of war is to impose a psychological pressure on the enemy for victory.

This debate is, in fact, a false debate, because if human soldiers kill when they receive orders from their chiefs, then is no compelling reason to invest in the creation of killer robots that, like humans, have feelings and emotions.

Going back to the use of LARS by terrorists, scay.net is a program that helps predict who will be a terrorist or not using big data and social media. But the question is, can this kind of program help ensure peace and security when countries also use terrorism against each other?

The goal of war between countries or between countries and terrorist organizations is to impose their interests by putting pressure on the enemy and making them lose. But the result of the war must be peace, and peace requires negotiation. How will decision makers and diplomats negotiate with killer robots when they become fully autonomous? Can a diplomat be replaced by a robot? How far will the autonomy of the robot go? If robots will be more intelligent than humans and able to make decisions by themselves, then what will be the future of humanity?

International society needs to make the most important choice in history. It needs to stop research and science in AI for military goals or stop the use of force. In another sense, it needs to choose between the end of science and research related to LARS and the end of humanity.



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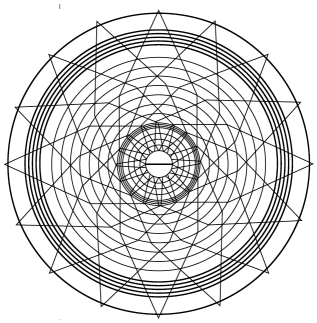

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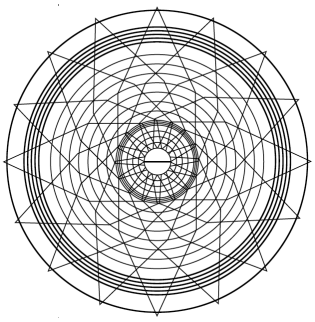

ТЕРРОРИЗМ И LARS[1]: МЕЖДУНАРОДНОЕ СООБЩЕСТВО МЕЖДУ КОНЦОМ НАУЧНЫХ ИССЛЕДОВАНИЙ И КОНЦОМ ЧЕЛОВЕЧЕСТВА

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Аннотация:

В этой статье представлено первоначальное обсуждение сценариев, связанных с терроризмом и LARS. LARS представляют собой реальный риск для международной безопасности, и если террористическая организация получит доступ к этому новому оружию, наиболее вероятным исходом станет конец человечества. В этой статье обсуждаются два аргумента: во-первых, LARS отличаются от ядерного оружия, потому что все государственные и негосударственные субъекты могут иметь к ним доступ; и, во-вторых, технический прогресс идет быстрее, чем международное право и дипломатия, которые должны запрещать или ограничивать использование LARS.
Рассматривая первый аргумент, в статье дается определение LARS и объясняются их различные классификации и особенности этого оружия, которые отличают его от ядерного оружия и делают его более опасным.
Поддерживая аргумент о том, что мир сталкивается с новыми угрозами, в статье обсуждаются различные сценарии использования LARS государственными и негосударственными субъектами, а также возможные решения для сокращения использования LARS и их рисков. В документе также содержится обзор международного права и международных механизмов, которые требуют переосмысления правил, касающихся применения силы. Выводы этой статьи заключаются в том, что всех дискуссий, касающихся международного права, будет недостаточно для уменьшения рисков возможного использования LARS в террористических целях, и что у международного сообщества будет только два варианта: прекратить исследования в области искусственного интеллекта в военной области или принять риск конца человечества, поддерживая исследования в этой области.

Ключевые слова: Автономные боевые роботизированные системы, роботы-убийцы, терроризм и международное право

[1] LARS - Lethal Autonomous Robot Systems – автономные боевые роботизированные системы

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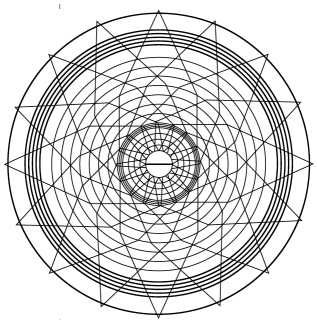

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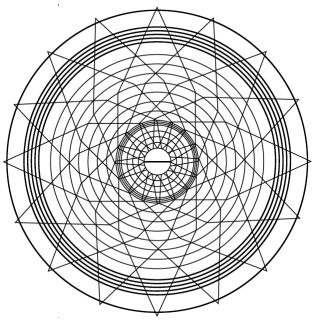

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