



CAMPAIGN TO **STOP** KILLER ROBOTS



Report on Activities

Convention on Conventional Weapons Group of Governmental Experts meeting
on lethal autonomous weapons systems

United Nations Geneva

20-21 August 2019

About this report

This report details activities by the Campaign to Stop Killer Robots at the Convention on Conventional Weapons (CCW) meeting of the Group of Governmental Experts on lethal autonomous weapons systems held at the United Nations (UN) in Geneva on 20-21 August 2019.

The report records the campaign's contributions, reviews the participation of governments in these meetings, and its annexes provide a summary of country views and the campaign's delegation list.

Campaign coordinator Mary Wareham and arms associate Jacquelyn Kantack of Human Rights Watch prepared this report, drawing from statements posted online by the CCW implementation support unit and WILPF's Reaching Critical Will Project. The report also draws on notes of the deliberations taken by Bonnie Docherty of Human Rights Watch and her Harvard Law School International Human Rights Clinic students Camille Marquis and Daniel Moubayed.

The Campaign to Stop Killer Robots is grateful for the generous donor support that enabled us to have a strong presence at the CCW meetings and to conduct outreach in the lead-up and afterwards.

This report is available on the Campaign to Stop Killer Robots website at:
www.stopkillerrobots.org/publications.

A handwritten signature in black ink, appearing to be 'Mary Wareham', written in a cursive style.

Mary Wareham
Washington DC
24 February 2020

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Lead-up to the CCW Group of Governmental Experts Meeting

At the CCW's annual meeting in November 2018, states agreed to continue the work of the Group of Governmental Experts (GGE) on lethal autonomous weapons systems (LAWS) established in 2016. They approved Mr. Ljupco Jivan Gjorgjinski of North Macedonia as GGE chair and scheduled two CCW meetings in 2019, on 25-29 March and 20-21 August, in addition to several days of "informal consultations."

There were several events and initiatives on killer robots in the period between the March and August 2019 GGE meetings.

The Campaign participated in informal consultations convened by the GGE chair at the UN in Geneva on [15 May](#), [28 June](#), [15 August](#), and 19 August.

The Dutch Parliament adopted a [resolution](#) on 14 May calling for a legally binding instrument on new weapons technologies, including autonomous weapons. This was followed, on 8 July, with a [19-page declaration](#) issued by parliamentarians from the Organization for Security and Cooperation in Europe (OSCE) urging OSCE states to support negotiations on a new treaty to ban lethal autonomous weapons.

CCW Group of Governmental Experts Meeting

A total of [94 countries](#) participated in the August 2019 GGE meeting, which is ten more than the attended the previous meeting in March 2019.¹ Other participants included UN agency UNIDIR, the International Committee of the Red Cross (ICRC), the Campaign to Stop Killer Robots, and various academics.

This was the eighth CCW meeting on lethal autonomous weapons systems since the talks began in 2014.² It was the fifth meeting by the Group of Governmental Experts on LAWS [established by the 2016 Review Conference](#) to "explore and agree on possible recommendations on options related to emerging technologies in the area of LAWS."

The [agenda](#) for the August 2019 GGE meeting built on the reports of the 2017 and 2018 GGE meetings and covered five topics: a) potential challenges posed by emerging technologies in the

¹ According to the [draft final report](#) issued by the UN on 21 August 2019, the 94 states attending the August meeting were comprised of 88 high contracting parties (Albania, Algeria, Argentina, Australia, Austria, Bangladesh, Belarus, Belgium, Benin, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cuba, Cyprus, Czechia, Denmark, Djibouti, Dominican Republic, Ecuador, El Salvador, Estonia, Finland, France, Germany, Greece, Guatemala, Holy See, Honduras, Hungary, India, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kuwait, Lao People's Democratic Republic, Latvia, Lebanon, Lithuania, Luxembourg, Mexico, Mongolia, Montenegro, Morocco, Netherlands, New Zealand, Nicaragua, North Macedonia, Norway, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Qatar, Republic of Korea, Romania, Russia, Saudi Arabia, Senegal, Serbia, Sierra Leone, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, State of Palestine, Sweden, Switzerland, Turkey, Uganda, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, and Venezuela), two signatory states (Egypt and Sudan), and four non-signatories (Haiti, Iran, Mozambique, and Myanmar).

² Previously, 87 states participated in the last CCW meeting on lethal autonomous weapons systems in March 2019, while 84 attended in April 2018, 90 attended in August 2018, 86 attended in November 2017, 94 attended in 2016, 90 in 2015, and 87 in 2014.

area of lethal autonomous weapons systems to international humanitarian law; b) characterization and concepts of the systems under consideration; c) Further consideration of the human element in the use of lethal force and aspects of human-machine interaction; d) review of potential military applications of related technologies; and e) possible options for addressing the humanitarian and international security challenges posed.

The GGE chair encouraged states to prepare substantively for the GGE meetings by submitting working papers in advance. The CCW received working papers from [Australia](#), [Austria/Brazil/Chile](#), [Brazil](#), [Estonia/Finland](#), [France](#), the [United States](#), and the [United Kingdom](#).

The week opened with an all-day informal consultation by the chair on 19 August. The official GGE meeting began on Tuesday, 20 August 2019. The four three-hour sessions essentially walked through and revised the draft report circulated by the chair prior to the meeting.

The conclusions of the report affirmed the guiding principles of the previous meetings in 2018 and agreed to an additional guiding principle on human-machine interaction. Yet again, the issue of “human control” was central to the deliberations. The United States and Russia, along with France, the United Kingdom, and others, opposed any reference to human control within the document. Instead, the phrase “consideration of the human element” is used in the report.

States recommended three streams of work to explore going forward on legal, technological, and military concerns, but did not provide any guidance for their work, desired output or plan for integrating the conclusions and identifying overlapping themes.

During the meeting, Russia and the United States explicitly rejected any move to negotiate new international law on fully autonomous weapons. Unlike the previous GGE meeting in March 2019, few states called for a political declaration as their desired focus for the GGE’s work.

The list of countries calling for a ban on fully autonomous weapons rose to 29 during the meeting, after Jordan called for CCW to negotiate a legally binding instrument to retain meaningful human control. Many of the ban states repeated that position during the meeting, including Brazil, Chile, Costa Rica, Cuba, Iraq, and Peru.

States agreed that the number of days for discussion in 2019 was insufficient, and many disagreed with the structure of informal consultations, arguing that they were inaccessible to smaller states and those with fewer resources.

States recommended that the Group of Governmental Experts meet for a total of 25 days over the course of 2020 and 2021. States also agreed that the Group would adopt two reports during that time, one at the meeting of CCW High Contracting Parties in 2020, and the other at the CCW Sixth Review Conference in 2021.

Campaign Activities

In the lead-up to the meeting, Campaign representatives discussed killer robots with Luxembourg's Minister of Defense François Bausch in June 2019. Also in June, the newly-elected Finnish government published a coalition programme that commits Finland to “promote the regulation of autonomous weapons systems via international negotiations” via a ban on “weapons systems based on artificial intelligence.”

The Campaign held a [regional meeting](#) of its members in Nur-Sultan, Kazakhstan on 18 April, met with officials at the Southern African Development Community (SADC) headquarters in Gaborone, Botswana in June and launched a Southeast Asia network in Bangkok, Thailand on 3 July. A dozen campaigners from seven countries engaged with states and officials attending the General Assembly of the Organization of American States (OAS) in Medellín, Colombia on 26-28 June. Campaigners from Finland, Ireland, the Netherlands, Norway, United Kingdom, and other countries held a strategy meeting in Antwerp, Belgium on 25-26 April to discuss parliamentary outreach and joint actions.

In the United States, the Campaign ran workshops at the 24th World Scout Jamboree in West Virginia in July and spoke at DefCon 2019 in Las Vegas, Nevada, on 8-11 August.

The Campaign to Stop Killer Robots delegation to the August 2019 CCW meeting consisted of more than four dozen representatives from Australia, Belgium, Cameroon, Canada, Colombia, Egypt, Finland, Germany, Japan, Kazakhstan, Netherlands, Norway, Pakistan, Spain, United Kingdom, and the United States (see Annex II).

During the August 2018 CCW meetings, Campaign representatives met with delegates from dozens of countries. For the first time, it did not hold a side event, but rather hosted a reception on 19 August attended by representatives from more than 15 states.³ The Campaign also met with Germany's Green Member of Parliament Katja Keul, who became the first parliamentarian from any country to participate in the CCW talks on killer robots.

In August, the Campaign released a 2:20 animation entitled “Will killer robots spark wars?” that has been subtitled into Dutch, French, Japanese, Russian, Spanish, and other languages for sharing on social media channels. The film tells the story of Stanislav Petrov, the Soviet lieutenant colonel who single-handedly saved the world in 1983 after defying a computer-generated order to launch a nuclear weapon strike.

Human Rights Watch published a [press release](#) calling out Russia and the United States in particular for blocking progress toward new international law on fully autonomous weapons. The Campaign to Stop Killer Robots published a [web post](#) at the end of the meeting.

³ States represented at the reception were Austria, Belgium, Canada, Chile, Cuba, Dominican Republic, Finland, Germany, Haiti, Jamaica, Kazakhstan, Mexico, New Zealand, Sierra Leone, and South Africa.

For more information, please see:

- CCW [2019 GGE website](#)
- WILPF Reaching Critical Will [2019 CCW webpage](#)
- Campaign to Stop Killer Robots [website](#) and [Flickr site](#) (photos)
- Campaign to Stop Killer Robots [YouTube page](#)

Annex I: Country Views on Killer Robots

21 August 2019

The Campaign to Stop Killer Robots monitors the positions of countries on the call to ban fully autonomous weapons.

Who wants to ban killer robots?

Twenty-nine countries are calling for a prohibition on fully autonomous weapons:

Alphabetical order

1. Algeria
2. Argentina
3. Austria
4. Bolivia
5. Brazil
6. Chile
7. China*
8. Colombia
9. Costa Rica
10. Cuba
11. Djibouti
12. Ecuador
13. Egypt
14. El Salvador
15. Ghana
16. Guatemala
17. Holy See
18. Jordan
19. Iraq
20. Mexico
21. Morocco
22. Nicaragua
23. Pakistan
24. Panama
25. Peru
26. State of Palestine
27. Uganda
28. Venezuela
29. Zimbabwe

Chronological order

1. Pakistan on [30 May 2013](#)
2. Ecuador on [13 May 2014](#)
3. Egypt on [13 May 2014](#)

4. Holy See on [13 May 2014](#)
5. Cuba on [16 May 2014](#)
6. Ghana on [16 April 2015](#)
7. Bolivia on 17 April 2015
8. State of Palestine on 13 November 2015
9. Zimbabwe on [12 November 2015](#)
10. Algeria on [11 April 2016](#)
11. Costa Rica on [11 April 2016](#)
12. Mexico on [13 April 2016](#)
13. Chile on [14 April 2016](#)
14. Nicaragua on 14 April 2016
15. Panama on 12 December 2016
16. Peru on 12 December 2016
17. Argentina on 12 December 2016
18. Venezuela on 13 December 2016
19. Guatemala on 13 December 2016
20. Brazil on 13 November 2017
21. Iraq on 13 November 2017
22. Uganda on 17 November 2017
23. Austria on 9 April 2018
24. China* on 13 April 2018
25. Djibouti on 13 April 2018
26. Colombia on 13 April 2018
27. El Salvador on 22 November 2018
28. Morocco on 22 November 2018
29. Jordan on 21 August 2019

* China [states that its call](#) is to ban the use of fully autonomous weapons, but not their development or production.

On 9 April 2018, [a group of African states](#) recommended concluding a legally binding instrument “at the earliest” and found that “fully autonomous weapons systems or LAWS that are not under human control should be banned.”

A March 2018 [working paper by the Non-Aligned Movement](#) calls for a “legally binding international instrument stipulating prohibitions and regulations on lethal autonomous weapons systems.” The campaign invites national statements affirming support for these objectives.

Annex II: Campaign Delegation List

Campaign Delegation

Convention on Conventional Weapons
Group of Governmental Experts on lethal autonomous weapons systems
United Nations Geneva, 20-21 August 2019

Campaign to Stop Killer Robots, @bankillerrobots

Head of Delegation: Ms. Mary Wareham, @marywareham
Ms. Clare Conboy-Stephenson, @ClareConboy
Ms. Isabelle Jones, @issjones
Ms. Farah Bogani, @_farahbogani
Ms. Alena Popova, @alyonapopova
Ms. Gugulethu Dube, @gugudube
Ms. Dalma Bíró
Mr. Johannes Mikeska

Asociación para Políticas Públicas

Ms. Maria-Pia Devoto, @piadevoto

Article 36, @article36

Mr. Richard Moyes, @rjmoyes
Ms. Elizabeth Minor, @elizabethminor3

Center for International Security and Policy (Kazakhstan), @cisp_astana

Mr. Alimzhan Akhmetov, @alimzhan_at

Deutsche Friedensgesellschaft, @dfgvk_bv

Mr. Marius Pletsch, @MariusPletsch
Mr. Michael Schulze von Glaßer, @MichaelSvG

Facing Finance, @FacingFinance

Mr. Thomas Küchenmeister
Ms. Vanessa Müller
Ms. Johanna Trittenbach, @Trittenbach

Human Rights Watch, @hrw

Mr. Steve Goose
Ms. Bonnie Docherty
Ms. Camille Marquis, @camillemarquis
Mr. Daniel Moubayed, @dmoubayedjd

International Committee for Robot Arms Control, @icracnet

Dr. Peter Asaro, @peterasaro

Dr. Thompson Chengeta, @DrThompsonLaw
Prof. Joaquín Rodríguez Álvarez, @JRodriguezAlv
Ms. Laura Nolan, @lauralifts
Dr. Frank Sauer, @drfranksauer
Dr. Daniele Amoroso
Dr. Rune Saugmann Andersen, @runedyret
Dr. Jürgen Altmann

Mines Action Canada, @MinesActionCan
Ms. Erin Hunt, @erinlynnhunt

Norwegian Peace Association, @Fredslaget
Ms. Lene Grimstad, @LeneGrimstad

PAX, @PAXforpeace
Mr. Daan Kayser, @DaanKayser
Ms. Susanne Maria “Maaike” Beenes, @maaikebns

Pax Christi Ireland
Mr. Tony D’Costa

Pax Christi Vlaanderen, @paxchristiVL
Mr. Willem Staes, @willemstaes

Peace Union Finland, @Rauhanliitto
Ms. Tuuli Vuori, @tuulivuori

Project Ploughshares, @ploughshares_ca
Ms. Branka Marijan, @brankamarijan

Protection
Mr. Ayman Sorour, @aymansorour
Ms. Enola Sorour

Rete Italiana per il Disarmo, @ReteDisarmo
Ms. Barbara Gallo

SEHLAC, @SehlaOrg
Mr. Camilo Serna

Soka Gakkai International, @SGI_OUNA
Ms. Hayley Ramsay-Jones, @HayleyRJones

Sustainable Peace and Development Organization (SPADO), @SPADOorg
Mr. Muhammad Raza Shah

Women's International League for Peace and Freedom, @WILPF @RCW_

Ms. Ray Acheson, @achesonray

Ms. Allison Pytlak, @a_pytlak

Ms. Katrin Geyer, @kat_geyer

Ms. Taniel Yusef, @Taniel_Yusef

MS. Shirine el Jurdi, @JurdiShirine

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Annex III: CCW and Related Media Coverage

The Campaign to Stop Killer Robots activities and the Convention on Conventional Weapons meeting more broadly in Geneva in August 2019 received significant media coverage, including in-depth coverage in Japanese and Dutch. The diplomatic talks on killer robots at the UN in Geneva attracted coverage in *Time Magazine*, *The Guardian*, *DW*, *Albawaba*, and *Yahoo News*, among other outlets.

The [article in Time Magazine](#) highlighted in particular China's minimal participation in the CCW discussions and whether their actions are assisting Russia in stalling negotiations. The article quoted ICRC's Laura Nolan and PAX's Daan Kayser. [The Guardian article](#) profiled Laura Nolan's previous work with and subsequent resignation over Project Maven and her current work with the Campaign to Stop Killer Robots, including some of the campaign's major concerns with killer robots. The article also highlighted some of the autonomous systems being developed around the world.

The Human Rights Watch Press release was republished by *Eurasia Review*, *Iranians Global Network*, and *Tolerance*.

HRW Press Release: 'Killer Robots:' Russia, US Oppose Treaty Negotiations: New Law Needed to Retain Meaningful Human Control Over the Use of Force,' 19 August 2019.

<https://www.hrw.org/news/2019/08/19/killer-robots-russia-us-oppose-treaty-negotiations>

(Geneva) – [Russia](#), the [United States](#), and a handful of other nations investing in autonomous weapons are preventing efforts to start negotiations on a new treaty to retain meaningful human control over the use of force, Human Rights Watch said today.

More than 70 member countries of the Convention on Conventional Weapons will meet in Geneva on August 20 and 21, 2019 for their eighth meeting since 2014 to discuss concerns raised by lethal autonomous weapons systems, also known as fully autonomous weapons or "killer robots." But the Convention on Conventional Weapons' "all talk, no action" approach indicates that it is incapable of dealing with this threat, Human Rights Watch said.

"Most governments want to negotiate a new treaty to retain meaningful human control over the use of force," said Steve Goose, arms director at Human Rights Watch, which coordinates the [Campaign to Stop Killer Robots](#). "But with a small number of countries blocking any progress, these diplomatic talks increasingly look like an attempt to buy time and distract public attention rather than to urgently address the serious challenges raised by killer robots."

Human Rights Watch and the Campaign to Stop Killer Robots urge states party to the convention to agree to begin negotiations in November for a new treaty to require meaningful human control over the use of force, which would effectively prohibit fully autonomous weapons. Only new international law can effectively address the multiple moral, legal, accountability, security, and technological concerns raised by killer robots.

The [Convention on Conventional Weapons](#) talks began in 2014 and were formalized three years later, but still have not produced anything more than some non-binding principles. Russia and the United States, as well as Australia, Israel, and the United Kingdom, opposed calls to move to negotiate a new treaty at the last meeting on killer robots in March, calling such a move premature.

At the previous talks, almost all countries have called for retaining some form of human control over the use of force, which is effectively equivalent to a ban on weapons that lack such control. To date, [28 countries](#) have explicitly supported a prohibition on fully autonomous weapons.

There is increasing evidence that developing these weapons would run contrary to the dictates of public conscience, Human Rights Watch said. Thousands of [scientists and artificial intelligence experts](#), more than 20 [Nobel Peace Laureates](#), and more than 160 [religious leaders](#) and organizations of various denominations also support a ban on killer robots. In 2018, Google released a set of [ethical principles](#) that includes a pledge not to develop artificial intelligence for use in weapons.

Killer robots would be unable to apply either compassion or nuanced legal and ethical judgment to decisions to use lethal force. Without these human qualities, the weapons would face significant obstacles in ensuring the humane treatment of others and showing respect for human life and dignity. According to international humanitarian law, the dictates of public conscience and principles of humanity should be upheld when there is no specific relevant treaty, which is the case with killer robots. The [28 countries](#) that have called for the ban are: Algeria, Argentina, Austria, Bolivia, Brazil, Chile, China (use only), Colombia, Costa Rica, Cuba, Djibouti, Ecuador, El Salvador, Egypt, Ghana, Guatemala, the Holy See, Iraq, Mexico, Morocco, Nicaragua, Pakistan, Panama, Peru, the State of Palestine, Uganda, Venezuela, and Zimbabwe.

The Campaign to Stop Killer Robots, which began in 2013, is a coalition of 112 nongovernmental organizations in 56 countries that is working to preemptively ban the development, production, and use of fully autonomous weapons.

“Both prohibitions and positive obligations are needed to ensure that systems that select and engage targets do not undermine ethical values and are always subject to meaningful human control,” Goose said. “The public expects greater efforts from governments to prevent the development of fully autonomous weapons, before they proliferate widely – in fact, nothing less than a legally-binding ban treaty.”

Republished:

Eurasia Review - <https://www.eurasiareview.com/19082019-killer-robots-russia-us-oppose-treaty-negotiations-says-hrw/>

Iranians Global Network - <https://t.co/LHjnjWvln2?amp=1>

Tolerance.ca (French) - <https://www.tolerance.ca/ArticleExt.aspx?ID=451158&L=fr>

CCW Coverage (English):

Time Magazine, “China and the U.S. Are Fighting a Major Battle Over Killer Robots and the Future of AI,” 13 September 2019. <https://time.com/5673240/china-killer-robots-weapons/>

Russia started sabotaging the discussion from the very first session. Throughout the morning of Aug. 21, its diplomats at the United Nations in Geneva took the floor, nitpicking language in a document meant to pave the way for an eventual ban on lethal autonomous weapons, also known as killer robots, an emerging category of weapons that would be able to fight on their own and decide who to target and kill.

“They were basically trying to waste time,” says Laura Nolan of the International Committee for Robot Arms Control, who watched with frustration in the hall.

But while Russia vigorously worked to derail progress, it had a quieter partner: China.

“I very much get the impression that they’re working together in some way,” says Nolan. “[The Chinese] are letting the Russians steamroll the process, and they’re happy to hang back.”

China has stayed coy at these discussions, which have taken place at least once a year since 2014. Its delegates contribute just the minimum, and often send ambiguous signals on where they

stand. They have called killer robots a “humanitarian concern,” yet have stepped in to water down the text being debated.

Stakes are high for the emerging military power. The robots in question — while not yet humanoid, techno-thriller Terminators — would nevertheless be deadly: Imagine dozens of drones swarming like bees on the attack, or intelligent vehicles patrolling a border with shoot-to-kill orders.

At times, Beijing has given some hope to activists demanding a ban on such weapons. According to the Campaign to Stop Killer Robots, the coalition Nolan’s organization is a part of, China last year joined 28 other states in saying it would support prohibiting fully autonomous weapons — but, Beijing clarified, just against their use on the battlefield, not their development nor production. That has raised eyebrows among experts skeptical of its intentions.

“They’re simultaneously working on the technology while trying to use international law as a limit against their competitors,” observes Peter Singer, a specialist on 21st century warfare. Quite a few countries at these meetings might levy the same accusation against the United States. While Washington has not obstructed the talks, it has not appeared keen to move things forward, either.

Part of the reluctance from major military powers over a ban stems from the extent artificial intelligence (AI) has affected their defense industries. In addition to the U.S. and China, these states also include the U.K., Australia, Israel, South Korea, and a few others. But it is China that has become the most formidable challenger in the AI competition against the American superpower.

President Xi Jinping has called for the country to become a world leader in AI by 2030, and has placed military innovation firmly at the center of the program, encouraging the People’s Liberation Army (PLA) to work with startups in the private sector, and with universities. Chinese AI companies are also making substantial contributions to the effort. Commercial giants such as SenseTime, Megvii, and Yitu sell smart surveillance cameras, voice recognition capabilities, and big data services to the government and for export. Such technology has most notably been used to police the country’s far western territory of Xinjiang, where the U.N. estimates up to 1 million Uighurs, an ethnic minority, have been detained in camps and where facial recognition devices have become commonplace.

“These technologies could easily be a key component for autonomous weapons,” says Daan Kayser of PAX, a European peace organization. Once a robot can accurately identify a face or object, only a few extra lines of code would transform it into an automatic killing machine. In addition to technology from commercial companies, the PLA has said it plans to develop new types of combat forces, including AI and unmanned — in other words autonomous or near-autonomous — combat systems.

The country’s domestic arms industry has obliged. A few examples include manufacturer Ziyang’s new Blowfish A2 drone. The company boasts it can carry a machine gun, independently fly as a swarm group without human operators, and “engage the target autonomously.” On land, Norinco’s Cavalry, an unmanned ground vehicle with a machine gun and rocket launchers, advertises near autonomous features. And by sea, Chinese military researchers are building unmanned submarines. The 912 Project, a classified program, hopes to develop underwater robots over the next few years.

“Killer robots don’t exist yet, but what we see is a trend towards increasing autonomy,” says Kayser of PAX. “We’re very close to crossing that line, and a lot of the projects that countries are working on — of course they don’t say they’re going to be killer robots. But if we see terms

like ‘autonomy in targeting’ — that’s getting very close to something that would be an autonomous weapon.”

All things considered, China’s behavior at the U.N. makes practical sense. Like other states, it is already developing intelligent weapons. The technology is fast outpacing the process at the U.N., where discussions will continue for another two years, if not longer. Without any clear international legal parameters, major militaries are feeling the pressure to invest in autonomous capabilities on the assumption that others are.

Such thinking especially characterizes the discourse around AI and autonomous weapons systems between China and the U.S.

“Essentially you have two sides that are worried about the other gaining an advantage,” says Singer. “That then has the ironic result of them both plowing resources into it, competing against each other, and becoming less secure.”

The other frontier unbound by international law is space. Here, China sees some opportunities to leapfrog American technology. It’s also where Beijing believes the U.S. would be most vulnerable in any conflict because of its dependence on information technology such as GPS, which not only helps soldiers and civilians get around, but services like stock exchanges and ATMs.

The country’s Shiyang-7 satellite, able to maneuver and dock with larger space objects, would in theory, experts say, also be able to latch on to and disable enemy space assets. More recently, China has been testing satellite SJ-17. It moves around with precision at very high altitudes — 22,000 miles above Earth. Satellites in orbit fly at tens of thousands of miles per hour. They possess the kinetic potency to shatter anything in their path, essentially acting as kamikazes against another country’s satellite. The U.S. military worries this is what China has in mind when developing satellites that can move so unusually in space.

Advanced space weapons, killer robots, and the U.S. and China preparing for World War III. It may all sound surreal, like a spectacular science fiction, but in the staid halls of the U.N., over the draft documents bureaucrats pass around, they are exactly what countries are anticipating. What makes their work more challenging than past international weapons bans is the preemptive nature of it, and the technology involved that would make enforcement and verification difficult, if not impossible.

Kayser knows time is running out. “An AI arms race would have no winners,” he says.

Preventing one from happening would depend on the major powers. He isn’t optimistic.

“They are not taking their responsibility to ensure that international peace and security is maintained. They are actually taking steps that are dangerous and risky for international peace.”

***The Guardian*, “Ex-Google worker fears ‘killer robots’ could cause mass atrocities,” 15 September 2019. <https://www.theguardian.com/technology/2019/sep/15/ex-google-worker-fears-killer-robots-cause-mass-atrocities>**

A new generation of autonomous weapons or “killer robots” could accidentally start a war or cause mass atrocities, a former top Google software engineer has warned.

Laura Nolan, who resigned from Google last year in protest at being sent to work on a project to dramatically enhance US military drone technology, has called for all AI killing machines not operated by humans to be banned.

Nolan said killer robots not guided by human remote control should be outlawed by the same type of international treaty that bans chemical weapons.

Unlike drones, which are controlled by military teams often thousands of miles away from where the flying weapon is being deployed, Nolan said killer robots have the potential to do “calamitous things that they were not originally programmed for”.

There is no suggestion that Google is involved in the development of autonomous weapons systems. Last month a UN panel of government experts debated autonomous weapons and found Google to be eschewing AI for use in weapons systems and engaging in best practice.

Nolan, who has joined the Campaign to Stop Killer Robots and has briefed UN diplomats in New York and Geneva over the dangers posed by autonomous weapons, said: “The likelihood of a disaster is in proportion to how many of these machines will be in a particular area at once. What you are looking at are possible atrocities and unlawful killings even under laws of warfare, especially if hundreds or thousands of these machines are deployed.

“There could be large-scale accidents because these things will start to behave in unexpected ways. Which is why any advanced weapons systems should be subject to meaningful human control, otherwise they have to be banned because they are far too unpredictable and dangerous.”

Google recruited Nolan, a computer science graduate from Trinity College Dublin, to work on Project Maven in 2017 after she had been employed by the tech giant for four years, becoming one of its top software engineers in Ireland.

She said she became “increasingly ethically concerned” over her role in the Maven programme, which was devised to help the US Department of Defense drastically speed up drone video recognition technology.

Instead of using large numbers of military operatives to spool through hours and hours of drone video footage of potential enemy targets, Nolan and others were asked to build a system where AI machines could differentiate people and objects at an infinitely faster rate.

Google allowed the Project Maven contract to lapse in March this year after more than 3,000 of its employees signed a petition in protest against the company’s involvement.

“As a site reliability engineer my expertise at Google was to ensure that our systems and infrastructures were kept running, and this is what I was supposed to help Maven with. Although I was not directly involved in speeding up the video footage recognition I realised that I was still part of the kill chain; that this would ultimately lead to more people being targeted and killed by the US military in places like Afghanistan.”

Although she resigned over Project Maven, Nolan has predicted that autonomous weapons being developed pose a far greater risk to the human race than remote-controlled drones.

She outlined how external forces ranging from changing weather systems to machines being unable to work out complex human behaviour might throw killer robots off course, with possibly fatal consequences.

“You could have a scenario where autonomous weapons that have been sent out to do a job confront unexpected radar signals in an area they are searching; there could be weather that was not factored into its software or they come across a group of armed men who appear to be insurgent enemies but in fact are out with guns hunting for food. The machine doesn’t have the discernment or common sense that the human touch has.

“The other scary thing about these autonomous war systems is that you can only really test them by deploying them in a real combat zone. Maybe that’s happening with the Russians at present in Syria, who knows? What we do know is that at the UN Russia has opposed any treaty let alone ban on these weapons by the way.

“If you are testing a machine that is making its own decisions about the world around it then it has to be in real time. Besides, how do you train a system that runs solely on software how to

detect subtle human behaviour or discern the difference between hunters and insurgents? How does the killing machine out there on its own flying about distinguish between the 18-year-old combatant and the 18-year-old who is hunting for rabbits?”

The ability to convert military drones, for instance into autonomous non-human guided weapons, “is just a software problem these days and one that can be relatively easily solved”, said Nolan. She said she wanted the Irish government to take a more robust line in supporting a ban on such weapons.

“I am not saying that missile-guided systems or anti-missile defence systems should be banned. They are after all under full human control and someone is ultimately accountable. These autonomous weapons however are an ethical as well as a technological step change in warfare. Very few people are talking about this but if we are not careful one or more of these weapons, these killer robots, could accidentally start a flash war, destroy a nuclear power station and cause mass atrocities.”

Autonomous threat?

Some of the autonomous weapons being developed by military powers around the world include: The US navy’s AN-2 Anaconda gunboat, which is being developed as a “completely autonomous watercraft equipped with artificial intelligence capabilities” and can “loiter in an area for long periods of time without human intervention”.

Russia’s T-14 Armata tank, which is being worked on to make it completely unmanned and autonomous. It is being designed to respond to incoming fire independent of any tank crew inside.

The US Pentagon has hailed the Sea Hunter autonomous warship as a major advance in robotic warfare. An unarmed 40 metre-long prototype has been launched that can cruise the ocean’s surface without any crew for two to three months at a time.

***Business Insider*, “A former Google engineer warned that robot weapons could cause accidental mass killings,” 16 September 2019. <https://www.businessinsider.com/former-google-engineer-warns-against-killer-robots-2019-9>**

A former Google engineer who worked on the company's infamous military drone project has sounded a warning against the building of killer robots.

Laura Nolan had been working at Google four years when she was recruited to its collaboration with the US Department of Defense, known as Project Maven, in 2017, according to the Guardian. Project Maven was focused on using AI to enhance military drones, building AI systems which would be able to single out enemy targets and distinguish between people and objects.

Google canned Project Maven after employee outrage, with thousands of employees signing a petition against the project and about a dozen quitting in protest. Google allowed the contract to lapse in March this year. Nolan herself resigned after she became "increasingly ethically concerned" about the project, she said.

Nolan described her role as a site reliability engineer, and this is why she was recruited to Maven. "Although I was not directly involved in speeding up the video footage recognition I realised that I was still part of the kill chain; that this would ultimately lead to more people being targeted and killed by the US military in places like Afghanistan," she said, according to The Guardian.

Nolan fears that the next step beyond AI-enabled weapons like drones could be fully autonomous AI weapons. "What you are looking at are possible atrocities and unlawful killings even under laws of warfare, especially if hundreds or thousands of these machines are deployed," she said. She said that any number of unpredictable factors could mess with the weapon's systems in unforeseen ways such as unexpected radar signals, unusual weather, or they could come across people carrying weapons for reasons other than warfare, such as hunting. "The machine doesn't have the discernment or common sense that the human touch has," she said.

She added that testing will have to take place out on the battlefield. "The other scary thing about these autonomous war systems is that you can only really test them by deploying them in a real combat zone. Maybe that's happening with the Russians at present in Syria, who knows? What we do know is that at the UN Russia has opposed any treaty let alone ban on these weapons by the way."

Although no country has yet come forward to say it's working on fully autonomous robot weapons, many are building more and more sophisticated AI to integrate into their militaries. The US navy has a self-piloting warship, capable of spending months at sea with no crew, and Israel boasts of having drones capable of identifying and attacking targets autonomously—although at the moment they require a human middle-man to give the go-ahead.

Nolan is urging countries to declare an outright ban on autonomous killing robot, similar to conventions around the use of chemical weapons.

"Very few people are talking about this but if we are not careful one or more of these weapons, these killer robots, could accidentally start a flash war, destroy a nuclear power station and cause mass atrocities," she said.

Business Insider has contacted Nolan for comment.

Inverse, "AI experts say killer robots are the next 'weapons of mass destruction,'" 18 September 2019. <https://www.inverse.com/article/59347-killer-robots-laura-nolan>

A former Google software engineer is sounding the alarm on killer robots.

Laura Nolan resigned from Google last year when the tech giant started working with the U.S. military on drone technology, and since then, she has joined the Campaign to Stop Killer Robots, warning that autonomous robots with lethal capabilities could become a threat to humanity.

Discussions concerning possibly banning autonomous weapons fell apart on August 21 during a United Nations meeting in Geneva, when Russian diplomats allegedly made a fuss over the language that was used in a document meant to begin the process of establishing a ban.

"If you're a despot, how much easier is it to have a small cadre of engineers control a fleet of autonomous weapons for you than to have to keep your troops in line?" Nolan tells Inverse.

"Autonomous weapons are potential weapons of mass destruction. They need to be made taboo in the same way that chemical and biological weapons are."

Even if it's not a despot or a terrorist group taking advantage of this technology, a robot capable of killing that's just in charge of security at a facility, for example, could unintentionally cause major problems.

Through her work, Nolan has often seen that the kind of software that would control autonomous weapons "behaves in ways we don't intend." Because these are lethal machines operating in an open environment, Nolan says they could "cause significant harm if they malfunction."

Nolan isn't alone in fearing the possible consequences of developing autonomous robots that are capable of killing. Elon Musk has repeatedly warned about the dangers of killer robots, and back in 2017, Musk and Alphabet's Mustafa Suleyman led a group of robotics and AI experts who

called on the United Nations to ban the use of this technology. They referred to such robots as “weapons of terror.”

“We do not have long to act,” the experts wrote in an open letter. “Once this Pandora’s box is opened, it will be hard to close.”

Google committed to not developing artificial intelligence for weapons last year after public outcry over its work with the U.S. military.

As depicted in the short film above, *Slaughterbots* (2017), we’re not necessarily talking about humanoid robots with guns for hands. A killer robot might be a flying quadcopter, an autonomous tank or something along those lines. If it’s a weapon that operates autonomously, there is an inherent risk to using it. These robots could be hacked by dangerous groups or simply start behaving abnormally and wreak havoc on a town or a city.

Nolan believes all nations should sign a treaty saying they will not develop killer robot technology. This would be similar to when 193 nations agreed to ban the use of chemical weapons in the late 1990s.

“We need to get these countries to understand the reality that autonomous weapons are not a strategic advantage: they would soon be developed by or sold to a plethora of nations,” Nolan says. “This is similar to drone warfare: they provided an advantage to a small number of states initially, but now have proliferated widely.”

We’re truly only beginning to imagine the implications this kind of technology could have.

Nolan says something that keeps her up at night is research like this study that was published in *WIRES* last year. It focuses on how facial recognition is getting better at identifying people from certain ethnic groups and explains that this could be useful for “border control, customs check, and public security.” If applied to killer robots, it’s not hard to imagine how this could be abused and could result in ethnic groups being targeted by these killing machines.

The Campaign to Stop Killer Robots has been working on this issue since it formed in 2012. The group says autonomous weapons “would lack the inherently human characteristics such as compassion that are necessary to make complex ethical choices.” Thus far, 28 countries are backing its call to ban the use of killer robots, including Mexico, Brazil and China.

Mary Wareham, global coordinator at the Campaign to Stop Killer Robots, tells *Inverse* that the main obstacle to getting this ban on killer robots done has been Russia and the United States. She says talks about a ban have been “held hostage” by the two countries, as they have claimed it’s “premature” to be considering such a ban.

“Diplomacy to deal with the killer robots threat is, unfortunately, going nowhere at the moment,” Wareham says. That said, Wareham says the campaign is always gaining more support outside of the U.N.

Wareham says that even if we get a president who agrees that these robots need to be banned, Russia will need to get on board. She says countries might adhere to a ban without joining the treaty, as we’ve seen with the U.S. not signing the landmine treaty but largely giving up the use of landmines, but it’d be better if everyone was signed on to it. As things stand, the situation may be moving in the wrong direction.

“I think it’s pretty obvious, in terms of the developments that you see today, that the money is being sunk into autonomous weapons systems,” Wareham says.

Back in February, the U.S. military began seeking out vendors that could help it develop machine learning and artificial intelligence technology so ground vehicles will be able to autonomously target enemies. Military code currently dictates that a human must be involved in any decision to fire on an enemy, but it’s possible that code could soon change.

Countries will almost certainly start utilizing killer robots if a ban is not successfully put together. Wareham says she worries that countries might not act on a ban until something terrible has already happened.

“Every day states delay moving to regulate is a day we get closer to pointing at a weapons system and saying, ‘That’s the killer robot we’ve been talking about,’” Wareham says. She says she doesn’t want to wait until there’s been a “mass casualty event” to get a ban done.

***Jurist*, “HRW: nations including US and Russia blocking potential treaty on autonomous weapons,” 19 August 2019.** <https://www.jurist.org/news/2019/08/hrw-nations-including-us-and-russia-blocking-potential-treaty-on-autonomous-weapons/>

Human Rights Watch (HRW) reported Monday that several major nations including the US and Russia are continuing to block a potential international treaty on the use of autonomous weapons.

HRW and the Campaign to Stop Killer Robots have been encouraging nations to enter negotiations for a new treaty requiring meaningful human interaction to apply the use of force. Various nations have come together in Groups of Governmental Experts as part of the Convention on Conventional Weapons to discuss lethal autonomous weapons since 2014. Twenty-eight members of the Convention on Conventional Weapons have called for an explicit ban on fully autonomous weapons. This ban has also been supported by thousands of scientists including artificial intelligence specialists as well as 20 Nobel Peace Laureates and over 160 religious leaders of various faiths and denominations.

The convention has been limited to nonbinding resolutions due to the influence of major weapons consumer nations. A number of major military nations including US, UK, Australia, Israel, and Russia have all called such a ban premature, but it should be noted that these nations are heavily responsible for and investing in the development of autonomous weapon systems.

While a binding treaty may still be off in the future, more than 70 member nations of the Convention on Conventional Weapons will be meeting again for the eighth time since 2014 in Geneva this week to discuss the development of autonomous “killer robots”.

***Common Dreams*, “Campaign Renews Demand for Ban on ‘Killer Robots,’ Calls Out US Obstruction,” 19 August 2019.** <https://www.commondreams.org/news/2019/08/19/campaign-renews-demand-ban-killer-robots-calls-out-us-obstruction>

Human rights advocates renewed their call for a preemptive ban on so-called “killer robots” on Monday as they accused the United States of being among a small number of countries working to halt progress on an international treaty to address the numerous concerns the weapons raise.

The accusation came a day before representatives from dozens of countries gather in Geneva to meet on the Convention on Certain Conventional Weapons, also known as the Inhumane Weapons Convention. The convention, according to the Campaign to Stop Killer Robots, has yet to produce a treaty with teeth. Such a document would effectively ban lethal autonomous weapons systems, as they’re formally known, by requiring “meaningful human control over the use of force.”

“Lives will be taken based on algorithms” without that kind of safeguard, the campaign said in a tweet on Sunday.

The U.S. isn't the only nation being singled out for being an outlier towards progress; the campaign says (pdf) that other military powers including Australia, Israel, Russia, South Korea, and the United Kingdom are also thwarting the advancement of a ban.

Twenty-eight governments back (pdf) a ban.

“Most governments want to negotiate a new treaty to retain meaningful human control over the use of force,” said Steve Goose, arms director at Human Rights Watch (HRW), which coordinates the Campaign to Stop Killer Robots, in a statement Monday. “But with a small number of countries blocking any progress,” he continued, “these diplomatic talks increasingly look like an attempt to buy time and distract public attention rather than to urgently address the serious challenges raised by killer robots.”

In its fresh statement, HRW summed up those challenges:

Killer robots would be unable to apply either compassion or nuanced legal and ethical judgment to decisions to use lethal force. Without these human qualities, the weapons would face significant obstacles in ensuring the humane treatment of others and showing respect for human life and dignity.

The call for a ban is backed by global [public opinion](#), and by [science and technology experts](#), [artificial intelligence \(AI\) experts](#), [Nobel laureates](#), and [religious leaders](#).

"The public," said HRW's Goose, "expects greater efforts from governments to prevent the development of fully autonomous weapons, before they proliferate widely—in fact, nothing less than a legally-binding ban treaty."

DW, “UN impasse could mean killer robots escape regulation,” 20 August 2019.

<https://www.dw.com/en/un-impasse-could-mean-killer-robots-escape-regulation/a-50103038>

UN Secretary-General Antonio Guterres has labeled lethal autonomous weapons (LAW) "politically unacceptable and morally repulsive," and called for them to be banned under international law. "Consider the consequences if an autonomous weapons system can independently select people as targets and attack them," Guterres has repeatedly told the international community, whose representatives are currently debating a ban on what's colloquially often termed killer robots in Geneva. Agreement, however, is not in sight. In fact, as one of the participants told DW, the talks are making no progress.

Many armies around the world are already testing weapons that combine artificial intelligence and robotics to form potentially lethal technology. When machines fight independently on the battlefield, according to military logic, the lives of soldiers are spared. Supporters argue that unlike humans, machines do not get tired and are less prone to making mistakes or decisions based on prejudice or emotion. This, they say, could help avoid civilian casualties.

According to the generally accepted definition of the International Committee of the Red Cross, autonomous weapons select their targets independently and fight them independently — soldiers are no longer involved, no triggers are pulled. Guided weapons that hover in the air until their target is in a favorable position before they attack already exist.

On the battlefields of the future, scientists say, algorithms could decide over life and death, not humans. That, however, would violate international humanitarian law stipulating a clear distinction must be made between combatants and civilians in attacks. Autonomous weapons systems cannot do that very well at present. Critics argue these weapons can't very well be equipped so as to allow them to make decisions in accordance with international law — at least not at the moment. That's why a human should always be "in the loop."

That has been under discussion for five years at the UN in Geneva, within the framework of the Convention on Certain Conventional Weapons. In 1995, the Convention succeeded in banning the use of blinding laser weapons before they were used in wars. The opponents of autonomous weapons hoped for a similar outcome, but these talks have been sluggish.

Pioneering countries in the field of autonomous weapons systems — Russia, the United States and Israel — reject a binding ban under international law. These military heavyweights face a group of 28 states that are demanding a binding ban, including Austria — the group's only European Union country. Their backing from civil society groups is strong and continues to grow — 113 nongovernmental organizations from more than 50 countries support the international Campaign to Stop Killer Robots, along with the European Parliament and 21 Nobel Peace Prize winners.

Germany has not joined either camp. The government made a clear commitment in its coalition agreement, stating: "We [reject autonomous weapon systems](#) that are beyond man's control. We want to outlaw them worldwide." All the same, the German delegation in Geneva considers a binding ban under international law to be unenforceable at present, arguing US and Russian opposition is too great, as is the danger that the negotiations could fail completely. The German government fails to mention that it, too, has an interest in autonomous weapons systems, including as part of the Franco-German Future Combat Aerial System.

Amidst the possibility that current talks may fail, a new proposal suggests continuing the negotiations for another two years in hopes that by then, the vague formulation reads, a "normative framework" has been reached. This is far removed from the binding ban demanded by 28 states.

The current proposal's "nebulous formulations" are disappointing, said Thomas Küchenmeister, German spokesman of the Campaign to Stop Killer Robots. The necessity of human control in the use of armed force is being "played down," he told DW. Küchenmeister expressed concern that the talks in Geneva "will never lead to a binding ban on autonomous weapons."

The critics of autonomous weapons systems are not ready to give up, however.

When an agreement over a ban on anti-personnel mines and cluster munitions could not be reached at the UN in Geneva, activists campaigned internationally for agreements that were eventually signed in Ottawa (1997) and Oslo (2008) respectively. Today, they are part of existing international law.

***Albawaba*, "When the Only Option is 'Not to Play'? Autonomous Weapons Systems Debated in Geneva," 21 August 2019. <https://www.albawaba.com/news/when-only-option-not-play-autonomous-weapons-systems-debated-geneva-1304015>**

United Nations Secretary General António Guterres made headlines last November by calling on states to negotiate a ban on lethal autonomous weapon systems, calling them 'morally repugnant and politically unacceptable'.

Heeding Mr Guterres' call, representatives from 70 countries are meeting in Geneva this week to discuss concerns raised by lethal autonomous weapons, commonly known as 'Killer Robots'.

Attending alongside them are a range of representatives from NGOs, industry and advocates from the Human Rights Watch coordinated Campaign to Stop Killer Robots. This week's meeting marks the 8th round of talks between members of the Convention on Conventional Weapons.

Whilst 28 countries and thousands of scientists and Artificial Intelligence experts have explicitly supported a ban on fully autonomous weapons, some of the world's leading military powers continue to dig in their heels. Conventional Weapons talks which have been ongoing since 2014 have still not produced anything more than non-binding principles. Russia, the USA, Australia, Israel and the UK opposed calls to negotiate a new treaty on killer robots in March, a stance likely to be carried over into this week's meeting according to early reports on the Geneva meeting.

Conventional Weapons talks which have been ongoing since 2014 have still not produced anything more than non-binding principles. Russia, the USA, Australia, Israel and the UK opposed calls to negotiate a new treaty on killer robots in March, a stance likely to be carried over into this week's meeting according to early reports on the Geneva meeting.

In a recent report for The Centre for a New American Security, a Washington based Defence Think Tank, autonomous weapons expert Paul Scharre drew an important distinction between existing, semi-autonomous and automatic weapons systems and hypothetical autonomous weapons systems of the future.

Whilst currently existing automatic systems such as land mines and missile defence systems respond to easily identifiable triggers and are usually subject to overriding human control, the potential systems of the future would exhibit some degree of 'learning, adaptation or evolutionary behaviour', allowing them to freely make decisions in 'open and unstructured environments'.

Whilst the development of autonomous weapons systems remain in its infancy, innovations in artificial intelligence raise the possibility of their deployment in the not too distant future.

In 2018, Chinese scientists revealed to the South China Morning Post that the People's Liberation Army Navy was developing autonomous submarines suitable for reconnaissance,

mine placement and ‘suicide attacks’ against enemy vessels, slated for deployment in 2018. Newer military drones such as the General Atomics MQ-9 Reaper can take off, land and fly to designated points without human intervention.

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A recent report by PAX, a Dutch NGO investigating autonomous weapons argues that innovations in commercial artificial intelligence in the fields of facial recognition, ground robotics and system integration may have implications for the defence sector. Reviewing the activities of 50 technology companies operating in 12 countries, the Report found that the activities of 21 companies should be treated with ‘high concern’ given their products’ implications for the development of lethal autonomous weapons.

Representatives of the Campaign to Stop Killer Robots argue lethal autonomous weapons would be ‘unable to apply compassion or nuanced legal and ethical judgements to decisions to use lethal force’. Ethical concerns have long been at the centre of discussions on autonomous weapons systems, but a number of pertinent principles of International Human Rights Law have been invoked to argue for their prohibition.

Allowing ‘Killer Robots’ to act without human oversight could potentially violate legal principles concerning the rights to life and remedy. Importantly, experts often cite the Martens Clause in discussions of the legal implications of autonomous weapons systems.

The Martens Clause, a long-standing custom in international law states that in the absence of any specific treaty, established custom, the principles of humanity and public conscience provide protection for civilians and combatants. In the case of proposed autonomous lethal weapons systems, the clause provides factors that states must consider when examining new challenges raised by emerging technologies.

According to Mr Scharre, many of the key concerns related to lethal autonomous weapons systems concern operational risk. His report argues that ‘autonomous weapons systems have a qualitatively greater degree of risk than equivalent semi-autonomous weapons that retain a human in the loop’. Given that autonomous systems lack the flexibility of humans to adapt to novel circumstances they may, in unexpected situations, make mistakes humans would not have. Two operational fears stand out in relation to autonomous weapons systems.

In the first instance, in combat operations, adversaries may try deliberately manipulate weapons systems. Adversarial hacking through ‘spoofing’- sending false data, behavioural hacking- taking advantage of predictable behaviours to ‘trick’ systems into performing a certain way, or by direct take-over of systems could lead to weapons malfunctioning.

Revelations in 2015 that computer hackers were able to remotely take control of driverless ‘autonomous vehicles’ and carry out or disable vital driving functions such as steering and braking should prove a cautionary tale for proponents of ‘autonomous’ systems.

Revelations in 2015 that computer hackers were able to remotely take control of driverless ‘autonomous vehicles’ and carry out or disable vital driving functions such as steering and braking should prove a cautionary tale for proponents of ‘autonomous’ systems.

Secondly, unanticipated interactions with complex environments can cause fatal errors. Mr Scharre cites the first pacific deployment of Lockheed Martin F-22 fighter jets as indicative of this phenomenon.

Whilst crossing the international dateline, F-22 jets reportedly experienced technical difficulties leading to the shutting down of all onboard computer systems and nearly a catastrophic loss of

aircraft. As systems and their environments become more complex and uncertain, the likelihood of fatal errors increases.

In the case of lethal autonomous weapons, failure may lead to autonomous weapons continuing to engage inappropriate targets until their magazines are exhausted. Interactions between malfunctioning weapons systems could lead to catastrophic consequences over wide areas. Enabling autonomous attacks could also lead to a rapid escalation of conflict.

As PAX note, 'delegating decisions to algorithms could result in the pace of combat exceeding human response time, creating the danger of rapid conflict escalation'. Taking military decisions out of the command of human beings may therefore prove strategically disastrous.

As PAX note, 'delegating decisions to algorithms could result in the pace of combat exceeding human response time, creating the danger of rapid conflict escalation'. Taking military decisions out of the command of human beings may therefore prove strategically disastrous.

Though security analysts rightly caution against adopting an uncritical assumption that new developments in military technology augur the coming of a 'Robocalypse', the high stakes at play in debates over lethal autonomous weapons system suggest the need for international regulation. Recent recommendations by ASRC Federal, an intelligence and defence consultancy may yet prove apt: 'like chemical and biological weapons, for weaponised AI, the only winning move is not to play'.

Yahoo, "New report claims 'killer robots' will eliminate targets without compassion," 23 August 2019. https://sports.yahoo.com/new-report-claims-killer-robots-will-eliminate-targets-without-compassion-182558340.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xILmNvbS8&guce_referrer_sig=AQAAAMrpwKtgm_DOJXm6RS0jW17zDnY1WBEMq-igTp9hQ10fj-nrSERHphcLxk6KblgQR6YU7pstMjtDJt5bBRBpBRv9QBDzGMU-09MfyQguTyOn0kapuXW15pFsW3x-XKR70X69chP8I05o1ZOaJW33TknUSY9qOWFhs3FwR4zf-gC7

A new report claims "killer robots" will destroy targets without compassion or ethical judgement if countries continue to develop autonomous weapons.

On Wednesday, Government experts debated the use of lethal autonomous weapons at a meeting of the UN's Convention on Certain Conventional Weapons in Geneva.

But Human Rights Watch warned today said that the meetings, which have run since 2014, are "all talk, no action".

The charity say the development of lethal machines is soaring without regulation.

HRW have also said countries such as Russia, the US, Britain, Israel and Australia have refused to back calls for a new treaty, declaring the need for 'some form of human control' over killer robots.

They are calling for new international law to deal with this glaring legal gap at the UN in November.

HRW said thousands of science and AI experts, plus 20 Nobel Peace Laureates, have supported a ban on killer robots.

Meanwhile, Dutch NGO Pax said on Friday that tech firms such as Amazon, Microsoft and Intel are putting the world most at risk of killer robots.

Pax cited 21 companies as 'high concern', notably Amazon and Microsoft who are both bidding for a £8.24 billion Pentagon contract to provide the cloud infrastructure for the US military.

Computer Science Professor Stuart Russell, of the University of California, Berkeley said: "Autonomous weapons will inevitably become scalable weapons of mass destruction, because if the human is not in the loop, then a single person can launch a million weapons or a hundred million weapons.

"The fact is that autonomous weapons are going to be developed by corporations, and in terms of a campaign to prevent autonomous weapons from becoming widespread, they can play a very big role."

***The Japan News*, “Rules must be made to restrict use of autonomous AI weapons systems,” 23 August 2019. <https://the-japan-news.com/news/article/0005957905>**

Artificial intelligence makes autonomous judgments, devoid of any human intention to kill enemies. If an AI-based weapons system is put into practical use, it may drastically change the nature of combat.

It is imperative for countries to deepen discussions on how to prevent unexpected developments brought on by the rapid progress of technology and make mutual concessions to work out realistic restrictive measures.

AI weapons are operated based on a huge amount of AI-analyzed information about such things as the situation in a combat zone. Their security advantages include a reduction in human error, as in the case of self-driving cars, and they also have the benefits of saving on labor and manpower.

At issue are lethal autonomous weapons systems (LAWS) under which targets are selected and killed autonomously by AI without a human command.

Unlike the situation of unmanned weapons such as drones, which are remote-controlled by humans, it may become difficult to determine where the responsibility for attacks lies when it comes to LAWS. There is concern that it will become impossible for humans to control combat. There is a view that in the first place, the power of life and death should not be left in the hands of AI. Obviously, LAWS pose many problems in light of the International Humanitarian Law and from ethical viewpoints.

Meeting in Geneva, representatives and experts from various countries have compiled a report concerning the restriction of LAWS.

The report emphasizes the necessity for involving human judgment in the use of LAWS, saying it is imperative to observe international laws such as the International Humanitarian Law.

Discuss concrete steps

The document has no legally binding power, but it can be said that sharing the principle to be emphasized among the countries marks a step forward.

Austria, Brazil and a group of developing countries call for the conclusion of a treaty banning LAWS from the standpoint of promoting disarmament. On the other hand, the United States and Russia, which have taken the lead in the development of AI weapons, have a cautious stance toward banning or restricting LAWS. Thus, a gap has emerged between the two sides.

A challenge ahead is whether it is possible to put together workable rules on the development and application of LAWS based on the recently compiled report.

It is necessary to deepen debate on such concrete measures as restrictions on weapons systems designed for direct killing of humans, and securing human involvement in making decisions by incorporating a computer program to obtain permission from a commanding officer before attacking.

It is essential to have the United States and Russia engage fully in making rules and enhance the transparency of AI arms and trust among the countries. At the same time, it is imperative to keep private-sector AI research and development from being regulated on the grounds that such technologies might be adapted for military purposes.

Japan takes the stand that it will not develop completely autonomous LAWS. The country must play a leading role in promoting a constructive debate on LAWS.

***The Asahi Shimbun*, “Editorial: Talks needed for legally binding regulations on robot weapons,” 26 August 2019. <http://www.asahi.com/ajw/articles/AJ201908260022.html>**

International efforts are entering a crucial stage for setting rules on whether machines should be allowed to make decisions on their own to take human lives.

A panel of experts recently met in Geneva to discuss regulations of robotic weapons and worked out a report of their three-year discussions. They presented a set of guidelines saying, among other things, that international humanitarian law should be applied to the conduct of robot weapons and that humans should be responsible for their use.

Those conclusions were rightly reached.

The panel, however, failed to agree there should be legally binding regulations, for example, in the form of a convention.

The experts on the panel say they will continue with their talks.

They should deepen their discussions even further toward the goal of setting effective and concrete regulation systems.

Targeted by the discussions are weapons systems equipped with artificial intelligence that are designed to work autonomously to kill or wound enemies. The lethal autonomous weapons systems (LAWS), as they are called, are also dubbed “killer robots.”

There is a deep rift of opinions between countries that are developing similar weapons, including the United States and Russia, and countries calling for a ban treaty, including those in Latin America and Africa.

Nations in both camps mostly agree there should be human involvement in the use of robot weapons, but when it comes to the extent of that “involvement,” they remain widely apart in their understanding.

Some argue, for example, that robots may be allowed to make individual decisions and movements on their own in the battlefield on condition that a comprehensive direction or order has been given by a human commander.

Deployment of such robots in a conflict area would realize a movie-like scene, where weapons that have no qualms about killing or wounding others will be fighting flesh-and-blood humans. The question here is about the meaning of war without a modicum of humanity and about whether society would allow that to happen. It is profoundly existential and ethical.

There is also an argument saying the use of robot weapons would, in fact, facilitate the practice of international humanitarian law.

The proponents of that argument say the use of such weapons would enhance the precision of enemy identification and attack actions, which would reduce the killing or wounding of wrong targets. They also say the availability of detailed records would facilitate investigations into, and reports on, illegal acts, which would be more humanitarian after all.

The deeper the learning functions of an AI system, however, the more it resembles a black box, which means humans never understand on what grounds the AI system has identified a target as such or has made a decision.

Some also point out the use of biased data in a learning process could cause an AI system to make wrong decisions. In addition, more than a few experts are concerned that robots could engage in unpredictable behavior in real battlefields, where the situation is so entangled and disordered.

We cannot just go along easily with an argument in favor of robotic weapons.

To start with, we should realize a total ban on the use of fully autonomous weapons, which operate independently of humans.

When that is done, we should then identify elements, in the respective phases of target selection, identification and attacks, that could pose a danger if they were left to the discretion of AI systems. We should seek to impose binding regulations on such elements. What is being tested here is the wisdom of humanity.

Institute for Security Studies – Africa, “Is Africa ready for weapons that call their own shots?” 28 August 2019.

<https://issafrica.org/iss-today/is-africa-ready-for-weapons-that-call-their-own-shots>

Robotic weapons that once activated can select and attack targets without any further human intervention are being developed by the United States, China, Russia, the United Kingdom, South Korea and Israel. Often listed as part of the ‘third revolution’ in warfare, after conventional weapons and nuclear weapons, lethal autonomous weapon systems (LAWS) will be unpredictable on the battlefield.

As a result they will be able to target civilians and other protected people in violation of international humanitarian law. Even if they are used in law enforcement situations or during peace time, it is unlikely that they will comply with international human rights law. More importantly, if these weapons violate these important laws, there will be an accountability or responsibility gap.

More than 70 countries gathered in Geneva this month for the United Nations Group of Governmental Experts (UN GGE) to discuss the imminent threat posed by these weapons. Twenty nine states, the Campaign to Stop Killer [Robots](#), scholars and many tech workers have called for their ban.

Likewise, [UN](#) Secretary-General António Guterres has spoken out strongly against them. He noted 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’.

The threat of lethal automated weapons to African peace and security is real

Although unconvincing, other participants in the UN GGE argue that lethal automated weapons may save lives since, unlike humans, they don’t act out of prejudice. They wouldn’t seek revenge in a way that humans would.

Yet in the fields of big data and artificial intelligence on which LAWS rely, it has already been proven that prejudices exist. The power of artificial intelligence is ‘so incredible, it will change society in some very deep ways, some ways will be good and some will be bad’, said billionaire Microsoft co-founder Bill Gates at the 2019 Human-Centred Artificial Intelligence Symposium at Stanford [University](#). ‘The world hasn’t had that many technologies that are both promising and dangerous – you know, we had nuclear energy and nuclear weapons.’

And in a world where LAWS are easily accessible, Africa is likely to be the most affected by such weapons. Africa is prone to conflict – some conflicts of which are fuelled by access to weapons coming from western countries.

According to an Institute for Security Studies [report](#), eight of the 15 UN peacekeeping missions are deployed in Africa. This shows how fragile the continent is compared to the rest of the world. This kind of fragility portends a number of challenges, particularly for civilian disarmament, the report says.

Lethal automated weapons will be able to target civilians in violation of international humanitarian law

Once lethal automated weapons are developed, they will undoubtedly proliferate. The history and experience with small arms and light weapons used by African states makes it likely that

LAWS will be diverted to non-state armed groups, with no regard for the laws of war. Once this happens, it would become difficult, if not impossible, to regulate their use in Africa.

The 2019 Global Peace Index [notes](#) that the Middle East and certain parts of Africa remain the world's least peaceful regions worldwide. Africa is home to four of the 10 least peaceful countries in the world, with no country from the region ranked higher than 30th on the index. Allowing the development of LAWS would have far-reaching repercussions for the continent. African states must therefore urgently work together to launch negotiations on a legally binding treaty prohibiting the development and deployment of these weapons.

Yet, notwithstanding the threats posed by lethal automated weapons to the continent, participation of African states in the UN GGE have been very poor over the years. At the UN GGE this month, only four African states (Algeria, South Africa, Egypt and Uganda) participated.

Prejudices exist in the fields of big data and artificial intelligence

Of these four, only two made submissions. In its intervention, South Africa emphasised the importance of ethics when considering the regulation of LAWS. Ethics are important to Africans as they include notions of ubuntu (compassion or humanity) or human dignity. These weapons must be under human control since human dignity requires that the decision to use force against fellow humans be made by humans, not machines.

In the same way that African states strongly advocated for the inclusion of small arms and light weapons in the Arms Trade [Treaty](#), the continent's nations must urgently take the lead and garner support for a legally binding instrument on LAWS. This is an opportunity for African states to be preventive rather than reactive in the disarmament arena.

The threat of lethal automated weapons to African peace and security is real and a clear way forward is required. The current participation of African states in the UN international debate on these weapons is not impressive.

In the lead-up to the UN Convention on Certain Conventional Weapons Meeting of the High Contracting Parties from 13 to 15 November 2019 in Geneva, there needs to be a mind shift from reaction to instilling preventive measures. This must be not only from the African diplomatic community, but also from stakeholders in Africa such as civil society organisations, the private sector and the media, who need to be more proactive.

Coverage of PAX report (English):

Yahoo, "Amazon, Microsoft, 'putting world at risk of killer AI': study," 21 August 2019.

https://news.yahoo.com/amazon-microsoft-may-putting-world-risk-killer-ai-224436302.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2x1LmNvbS8&guc e_referrer_sig=AQAAAMrpwKtgm_DOJXm6RS0jWl7zDnYlWBEMq-iqTp9hQ10fj-nrSERHphcLxk6KblgQR6YU7pstMjtDJt5bBRBpBRv9QBDzGMU-09MfyQguTyOn0kapuXW15pFsW3x-XKR70X69chP8I05o1ZOaJW33TknUSY9qOWFhs3FwR4zf-gC7

Washington (AFP) - Amazon, Microsoft and Intel are among leading tech companies putting the world at risk through killer robot development, according to a report that surveyed major players from the sector about their stance on lethal autonomous weapons.

Dutch NGO Pax ranked 50 companies by three criteria: whether they were developing technology that could be relevant to deadly AI, whether they were working on related military projects, and if they had committed to abstaining from contributing in the future.

"Why are companies like Microsoft and Amazon not denying that they're currently developing these highly controversial weapons, which could decide to kill people without direct human involvement?" said Frank Slijper, lead author of the report published this week.

The use of AI to allow weapon systems to autonomously select and attack targets has sparked ethical debates in recent years, with critics warning they would jeopardize international security and herald a third revolution in warfare after gunpowder and the atomic bomb.

A panel of government experts debated policy options regarding lethal autonomous weapons at a meeting of the United Nations Convention on Certain Conventional Weapons in Geneva on Wednesday.

Google, which last year published guiding principles eschewing AI for use in weapons systems, was among seven companies found to be engaging in "best practice" in the analysis that spanned 12 countries, as was Japan's Softbank, best known for its humanoid Pepper robot.

Twenty-two companies were of "medium concern," while 21 fell into a "high concern" category, notably Amazon and Microsoft who are both bidding for a \$10 billion Pentagon contract to provide the cloud infrastructure for the US military.

Others in the "high concern" group include Palantir, a company with roots in a CIA-backed venture capital organization that was awarded an \$800 million contract to develop an AI system "that can help soldiers analyse a combat zone in real time."

"Autonomous weapons will inevitably become scalable weapons of mass destruction, because if the human is not in the loop, then a single person can launch a million weapons or a hundred million weapons," Stuart Russell, a computer science professor at the University of California, Berkeley told AFP on Wednesday.

"The fact is that autonomous weapons are going to be developed by corporations, and in terms of a campaign to prevent autonomous weapons from becoming widespread, they can play a very big role," he added.

The development of AI for military purposes has triggered debates and protest within the industry: last year Google declined to renew a Pentagon contract called Project Maven, which used machine learning to distinguish people and objects in drone videos.

It also dropped out of the running for Joint Enterprise Defense Infrastructure (JEDI), the cloud contract that Amazon and Microsoft are hoping to bag.

The report noted that Microsoft employees had also voiced their opposition to a US Army contract for an augmented reality headset, HoloLens, that aims at "increasing lethality" on the battlefield.

- What they might look like -

According to Russell, "anything that's currently a weapon, people are working on autonomous versions, whether it's tanks, fighter aircraft, or submarines."

Israel's Harpy is an autonomous drone that already exists, "loitering" in a target area and selecting sites to hit.

More worrying still are new categories of autonomous weapons that don't yet exist -- these could include armed mini-drones like those featured in the 2017 short film "Slaughterbots."

"With that type of weapon, you could send a million of them in a container or cargo aircraft -- so they have destructive capacity of a nuclear bomb but leave all the buildings behind," said Russell.

Using facial recognition technology, the drones could "wipe out one ethnic group or one gender, or using social media information you could wipe out all people with a political view."

The European Union in April published guidelines for how companies and governments should develop AI, including the need for human oversight, working towards societal and environmental wellbeing in a non-discriminatory way, and respecting privacy.

Russell argued it was essential to take the next step in the form of an international ban on lethal AI, that could be summarized as "machines that can decide to kill humans shall not be developed, deployed, or used."

***Tech Times*, "Amazon, Microsoft Developing Killer AI That Puts the World At Risk, Says Study," 23 August 2019. <https://www.techtimes.com/articles/245098/20190823/amazon-microsoft-developing-killer-ai-that-puts-the-world-at-risk-says-study.htm>**

Microsoft, Amazon, and Intel are three of the companies mentioned in a new report calling out companies for developing killer artificial intelligence.

The Report

Dutch NGO Pax studied and analyzed 50 companies. It watched out for three criteria: development of technology relevant to deadly robot technology, work related to military projects, and whether or not they committed to abstaining from both in the future.

"Why are companies like Microsoft and Amazon not denying that they're currently developing these highly controversial weapons, which could decide to kill people without direct human involvement?" lead author Frank Slijper said in a statement to the AFP.

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Pax found 22 companies that were of "medium concern" while 21 others were of "high concern." Both Microsoft and Amazon were tagged to be particularly concerning due to their bids on a \$10 billion Pentagon contract that's set to give cloud infrastructure for the United States military.

The Pax report also noted that Microsoft employees expressed that they opposed a United States Army contract for HoloLens, which increases the lethality of the battlefield.

"Autonomous weapons will inevitably become scalable weapons of mass destruction, because if the human is not in the loop, then a single person can launch a million weapons or a hundred million weapons," Stuart Russell of the University of California, Berkeley told AFP.

He added that autonomous weapons will inevitably be developed by different corporations and these corporations can play a huge role in a campaign preventing these weapons from being more widespread.

US Blocking Treaties To Ban Killer Robots

Lethal autonomous weapons or killer robots were a hot topic during a meeting of the United Nations Convention on Certain Conventional Weapons in Geneva on Wednesday, Aug. 21.

According to Common Dreams, human rights advocate Campaign to Stop Killer Robots are accusing the United States for being one of the countries that push against a treaty that would ban lethal autonomous weapons systems by requiring "meaningful human control over the use of force."

Other major military forces that are against the treaty include Russia, United Kingdom, Australia, Israel, South Korea.

Japanese coverage:

<https://www.sankeibiz.jp/business/news/190823/cpc1908230733002-n1.htm>

<https://www.asahi.com/articles/ASM8Q3DBTM8QUHBI00P.html>

<https://www.jiji.com/jc/article?k=2019082100599&g=int>

<https://www.nhk.or.jp/kaisetsu-blog/100/318066.html>

<https://www3.nhk.or.jp/news/html/20190821/k10012042431000.html>

<https://www.nikkei.com/article/DGXMZO48847910S9A820C1000000/>

<https://www.afpbb.com/articles/-/3240874>

<https://www.jiji.com/jc/article?k=2019082201131&g=int>

<https://nikkan-spa.jp/1470085>

Dutch coverage:

<https://www.demorgen.be/nieuws/techbedrijven-betrokken-bij-productie-killer-robots~bb88ec00/>

https://www.standaard.be/cnt/dmf20190819_04567047

<https://radioplus.be/#/radio1/herbeluister/696aabf7-8e90-11e3-b45a-00163edf75b7/b2dff2d-c2a4-11e9-a396-02b7b76bf47f/>

Finnish coverage:

<https://www.iltalehti.fi/digi uutiset/a/2026dffa-03f0-408b-b2a3-64292a17ab30>

<https://www.tivi.fi/uutiset/tv/a4434ea7-c9da-44a5-81d9-55c0b89c132a>

Swedish coverage:

<https://svenska.yle.fi/artikel/2019/09/15/mordarrobotarna-lurar-narmare-i-tiden-an-du-tror-beslutet-att-doda-far-aldrig>

Spanish coverage:

<https://www.lavanguardia.com/internacional/20190915/47367830642/extrabajadora-google-denuncia-robots-asesinos-pueden-causar-atrocidades-masivas.html>