
**Global Governance of Autonomous Weapon Systems:
The Russia Case Study**

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ABSTRACT

Many states are developing artificial intelligence (AI) technologies which will be used for military and non-military purposes, however, there is currently no consensus on the governance of the technologies emerging in across this wide functional spectrum, especially when examining autonomous weapon systems. This paper investigates the practices of one country, the Russian Federation, to examine how it is developing and applying these systems for military purposes. In doing so, this work aims to analyze an understanding of Russia's processes within global governance of autonomous weapon systems. In better understanding how the Russian Federation directs policy surrounding autonomous weapon systems, areas of common interest regarding governance might be facilitated more easily within the international community. This work defines terminology of these emerging technologies and then presents legal frameworks to guide their possible operations while evaluating statements and publications addressing Russia's positions on AI technologies pertinent to these emerging technologies, ending with the ramifications on global governance. Ultimately, this paper concludes that the Russian Federation's is pursuing narrower means of regulation internationally so that it may continue domestic development without much outside restriction and that broad global governance on autonomous weapon systems will remain difficult to attain.

INTRODUCTION

The Russian Federation, much like the United States, China, and other states, has an incentive to steer regulation of technologies in manners which it views as beneficial to its national interests. Consequently, this action by Russia, as with other states, adds to a patchwork of understandings which are not universal about technologies, their development, and applications. This warrants discussion regarding international regulation as a consequence, and with autonomous weapon systems (AWS), this is no different. AWS are a broadly understood classification of technologies, but their definitions across different entities has muddled the ability of casual observers of international politics and well-versed individuals alike to discern not only what is being discussed, but also what purposes those discussion items serve. The value and purpose of examining the actions of the Russian Federation serves an important purpose, as Russia not only is a member of the Convention on Certain Conventional Weapon's Group of Governmental Experts addressing LAWS, but also because the clarification and better understanding of Russia's policies and actions might allow for bi- and multilateral negotiations on this subject to be better facilitated. As a major actor on the international stage, Russia has similarly major influence, and its actions and decisions warrant analysis for the opportunity to build a stronger international governance system where possible.

Additionally, the purpose of global governance is to create a harmony of interests for the benefit of all states. In examining the system of global governance through the lens of one state, among many others, clarity of those interests rises to the forefront of the discussions surrounding how and what to govern appropriately. Without this clarity, global governance is delayed, sidetracked, and not implemented, hence the importance of understanding national perspectives.

The decision to write about the global governance of autonomous weapon systems through a case study of the Russian Federation arises from a few areas. Russia is a prominent global actor whose actions and decisions have impact beyond its own borders. Additionally, improved understandings of policies and actions taken by states better facilitates common interest building, which is critical for implementing global governance. Finally, autonomous weapon systems are an emerging technology, and with that comes emerging security threats. Investigating the legal regimes surrounding these technologies is imperative to preventing their misuse and inappropriate regulation in the global community. For the purposes of this work, see Table 1, below, for an overview of appropriate and corresponding acronyms used throughout this paper.

Acronyms
AAW - Automated and Automatic Weapons
AI - Artificial Intelligence
ARS - Autonomous Robotic Systems
AWS - Autonomous Weapon Systems
CCW - Convention on Certain Conventional Weapons
GGE - Group of Governmental Experts
HRW - Human Rights Watch
IHL - International Humanitarian Law
IHRL - International Human Rights Law
LAWS - Lethal Autonomous Weapon Systems
LOAC - Law of Armed Conflict
MALD - Miniature Air Launched Decoy
MALD-J - Miniature Air Launched Decoy - Jammer
SAWS - Semi-Autonomous Weapon Systems
UCAV - Unmanned Combat Aerial Vehicle
UGCV - Unmanned Ground Combat Vehicle
USV - Unmanned Surface Vehicle
UUV - Unmanned Underwater Vehicle

Table 1: Acronyms.

MATERIALS AND METHODS

For this analysis, a synthesis of technical definitions of weapon systems held by governments, leading experts in academia, and relevant non-governmental organizations forms the foundation of examination, as there are no universally-held definitions. Next, international law, manifested through conventions, customary norms, and relevant bodies, serves as a framework against which the weapon systems are reconciled for legality. Afterwards, statements by government officials, excerpts from government documents, and relevant third-party information from academia and media sources are investigated to determine how the Russian develops and applies autonomous weapon systems. In light of this, any possible impact on global governance is discussed, and the ramifications for it are analyzed.

Technical Definitions

Historically, states have become interested in the development of emerging weapon systems for national security purposes, and the use of artificial intelligence (AI) for the development of new weapons has become more common as well. However, there are gaps within international governance pertaining to emerging technologies, and the governance of AI is no exception. In particular, the weaponization of AI poses a unique challenge for global governance due to the lack of a universal definition for autonomous systems, which include machines with varying levels of autonomy and human control that do not neatly fit into accountability measures for violations of international law. Without a definition with which to apply international legal frameworks, the efforts to govern this emerging area of technology remains absent. The following sections examine the various degrees of autonomy between different autonomous robotic systems (ARS) for military purposes.

Autonomous Robotic Systems

Autonomous robotic systems are machines over which humans have various levels of control. They are not necessarily for military purposes. A self-driving car, a robotic assistant in an assisted living community, and a drone are all examples of a ARS and the wide array of functions it might possess, but the crux of an ARS is that it operates with varied levels of autonomy from humans, while ultimately possessing a minimal amount, which is known as “human-in-the-loop.”¹

Degrees of Autonomy Between ARS

ARS for military purposes – as opposed to those for non-military purposes – include a swath of systems which possess increasing amounts of autonomy from human controllers and monitors for the technical and operational purposes of activation, movement, acquiring targets, and engaging targets through different means. They comprise the class of weapons which are known as lethal autonomous weapon systems, or LAWS, which includes drones, semi-autonomous weapon systems (SAWS), and autonomous weapon systems (AWS). The terms defined here are not universal, given that no universal terminology exists, but they reflect a synthesis of various broadly-held definitions for the purpose of this paper, including from Human Rights Watch and the US Department of Defense.

¹ Docherty, B., 2012. *Losing humanity: The case against killer robots*. Human Rights Watch. Page 2.

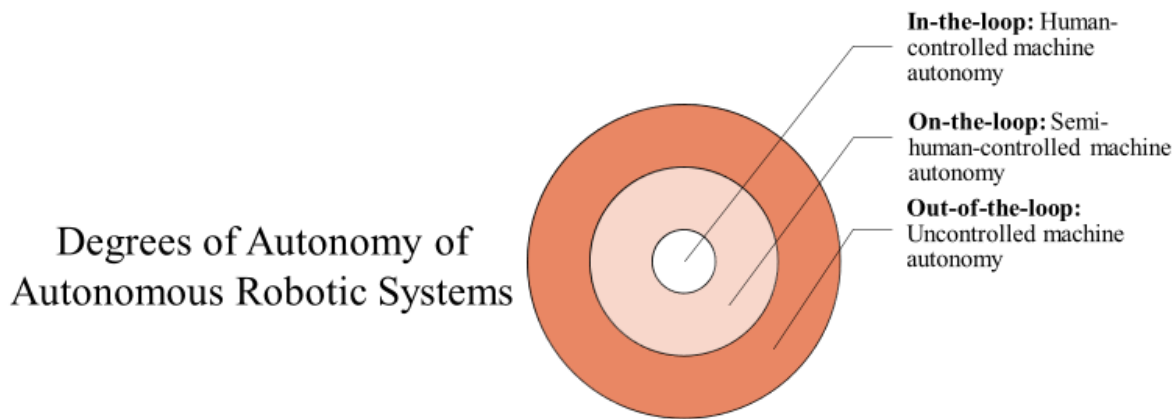


Figure 1: Degrees of Autonomy of ARS

Drones

The most widely known type of ARS for military purposes are drones, which can be divided into numerous categories, including, but not limited to: unmanned combat aerial vehicles (UCAV), unmanned surface vehicles (USV), unmanned underwater vehicles (UUV), and unmanned ground combat vehicles (UGCV), which militaries use for reconnaissance, operations, targeting killings, and other military functions.² Given that many drones are most often controlled remotely and cannot leave a military base, direct movement, acquire targets, engage targets, or return to a military base at the conclusion of a mission or in the event of a problem without a human operator’s input, drones are not necessarily SAWS, but could in some instances fit into that

² While drones of all types listed here can be further distinguished by specifications relating to combat, remote piloting, and other technical operating terms, these categories are suitable for the denoting of ARS within this paper given its focus on LAWS. For more descriptive information on the differences between types of drones, see: Roblin, S., 2019. “Don’t Just Call Them ‘Drones’: A Guide To Military Unmanned Systems On Air, Land And Sea.” September 30, 2019. <https://www.forbes.com/sites/sebastienroblin/2019/09/30/dont-just-call-them-drones-a-laypersons-guide-to-military-unmanned-systems-on-air-land-and-sea/#35a937172b00>.

category.³ China's CAIG Wing Loong, also known as the "Pterodactyl," is one example which started as entirely human-operated⁴ but later developed technical capabilities placing it into the SAWS category.⁵ Current language from Human Rights Watch (HRW)⁶ surrounding this level of autonomy would place drones into the category of "human-in-the-loop," as humans select and command targets upon which force is used.⁷

Semi-Autonomous Weapon Systems

SAWS sit at the next rung among ARS in terms of increased autonomy compared with drones' various classifications. Unlike drones, all SAWS possess at least one function which does not require human interaction or instruction, whether that be leaving from or returning to base or the targeting of or engaging with a target.⁸ SAWS, therefore, straddle the middle ground between total human operation and total autonomous operating capabilities, allowing humans some control over their operations. This places SAWS into the category of weapons defined by HRW as both "human-in-the-loop" and "human-on-the-loop,"⁹ as some SAWS require human authorization for

³ Docherty, B., 2012. *Losing humanity: The case against killer robots*. Human Rights Watch. Page 6.

⁴ Wong, E., 2013. "Hacking US secrets, China pushes for drones." *The New York Times*. September 20, 2013. <https://www.nytimes.com/2013/09/21/world/asia/hacking-us-secrets-china-pushes-for-drones.html>.

⁵ Khan, B., 2018. "AVIC to launch new Wing Loong UAV Variant in 2018." *Quwa Defense News & Analysis Group*. January 25, 2018. <https://quwa.org/2018/01/25/avic-to-launch-new-wing-loong-uav-variant-in-2018/>.

⁶ The language of Human Rights Watch regarding "loop" differentiation is used as a point of common reference during talks regarding hypothetical regulation of LAWS, but it is not legally binding terminology.

⁷ Docherty, B., 2012. *Losing humanity: The case against killer robots*. Human Rights Watch. Page 2.

⁸ Department of Defense, 2012. *Directive on Autonomy in Weapons Systems*, Number 3000.09. Page 14.

⁹ Docherty, B., 2012. *Losing humanity: The case against killer robots*. Human Rights Watch. Page 2.

selecting and engaging targets, while others simply have operators monitoring the system's decisions in the event that an acquired target is invalid and therefore is one from which the SAWS needs to be disengaged.

SAWS do not fit neatly into any type of categorization due to the partial autonomy possessed by many systems and their frequent dependence and subservience to human operators, but they are the most common type of ARS which currently exists. They include weapons of “fire and forget” and loitering nature, such as the Israeli Harop, meaning that they act as kamikaze weapons upon acquiring a target for which they are programmed to search and wait.¹⁰ SAWS also include more stationary weapon systems, such as the South Korean SGR-A1, a sentry gun situated on the South Korean side of the Korean Demilitarized Zone which can be told by human operators to disengage, but otherwise acts independently of human direction.¹¹

Autonomous Weapon Systems

AWS are weapons which possess the highest amount of autonomous capacity within the ARS grouping. They, unlike their drone and SAWS counterparts, are completely removed from human control and can activate, move, target, engage, and deactivate without human operations or instruction. This gives them the designation of being “human-out-of-the-loop,” illustrating that they can designate and deliver force to a target without input from an operator, according to

¹⁰ “Harop Loitering Munitions UCAV System.” Air Force Technology. N.d. <https://www.airforce-technology.com/projects/haroploiteringmuniti/>.

¹¹ 2014. “Future Tech? Autonomous Killer Robots Are Already Here.” NBC News. May 14, 2014. <https://www.nbcnews.com/tech/security/future-tech-autonomous-killer-robots-are-already-here-n105656>.

HRW.^{12 13} This is a category of weapon systems which does not yet in exist since no weapon operates, currently, with “human-out-of-the-loop” capacity, and some countries, such as the United States, are neither currently developing nor planning to develop weapons of this category, although this might change given interests and needs of the military over time.^{14 15} The US Department of Defense defines AWS slightly differently than HRW, however, and notes that an AWS, while able to select a target and deliver force without human direction, can still have its functions overridden by a human operator,¹⁶ thereby keeping in the category of “human-on-the-loop” as opposed to “human-out-of-the-loop.”

Lethal Autonomous Weapon Systems

LAWS is the overarching umbrella terminology and category that includes many drone, SAWS, and AWS technologies, but there is one further distinction regarding the actions which it conducts. Specifically, weapons within the LAWS category use kinetic, lethal force, regardless of the level of autonomy, spanning “in-the-loop,” “on-the-loop,” and “out-of-the-loop,” technologies. Not all UCAV, SAWS, and AWS, however, deliver kinetic or lethal force, creating a headache for terminology relating to definitions and governance. For example, the US currently employs use of the Miniature Air Launched Decoy (MALD) and Miniature Air Launched Decoy – Jammer (MALD-J), decoy air-launched vehicles that deceive radar and use non-kinetic and non-lethal force

¹² Docherty, B., 2012. *Losing humanity: The case against killer robots*. Human Rights Watch. Page 2.

¹³ This also has created terminology such as “fully” autonomous weapon systems, but for the purposes of this paper, AWS implies full autonomy.

¹⁴ Department of Defense, 2012. Directive on Autonomy in Weapons Systems, Number 3000.09. Pages 2-3.

¹⁵ Sayler, K.M., 2019. Defense Primer: US Policy on Lethal Autonomous Weapon Systems. Congressional Research Service. March, 27, 2019. Updated December 19, 2019.

¹⁶ Department of Defense, 2012. Directive on Autonomy in Weapons Systems, Number 3000.09. Page 13.

to jam radar, respectively.¹⁷ LAWS, therefore, do not include these types of autonomous weapon systems which are non-lethal and non-kinetic in use.

While seemingly semantic, this does have ramifications for governance, as multilateral discussions specifically focus on the subject of LAWS and not non-lethal AWS, such as in the Group of Governmental Experts at the United Nations.¹⁸ Subsequently, the differentiation of LAWS from AWS holds significance within the international arena, as only the former category is being addressed regarding regulation. AWS, as they are not necessarily lethal, have not and do not garner the same opposition or movement for regulation or a pre-emptive ban, making the distinguishing of the two categories crucial for these negotiations and discussions. Unfortunately, public discourse, particularly of critics of LAWS, does not make this differentiation clear, as LAWS is typically used as a catch-all for AWS, SAWS, and drone technologies alike, regardless of their utilization of lethal, non-lethal, kinetic, or non-kinetic force, and this contributes to the oversimplification of dialogue addressing these machines.¹⁹

¹⁷ FY16 Air Force Programs. 2016. Miniature Air Launched Decoy (MALD) and Miniature Air Launched Decoy – Jammer (MALD-J). United States Air Force. <https://www.dote.osd.mil/Portals/97/pub/reports/FY2016/af/2016mald.pdf?ver=2019-08-22-105431-140>.

¹⁸ Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons System. 2019. Report of the 2019 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems. 25 September 2019. <https://undocs.org/en/CCW/GGE.1/2019/3>.

¹⁹ Evans, H., and Natalie Salmanowitz. 2019. "Lethal Autonomous Weapons Systems: Recent Developments." Lawfare. March 7, 2019. <https://www.lawfareblog.com/lethal-autonomous-weapons-systems-recent-developments>.

Classifications of Autonomous Robotic Systems (ARS)	Definition (Implies Use of Lethal Force)	Includes
Human-in-the-loop	ARS can select targets and deliver force only with a human command.	Drones, UCAV, UGCV, USV, UUV, SAWS
Human-on-the-loop	ARS can select targets and deliver force under the oversight of a human operator who can override the robots' actions.	Drones, UCAV, UGCV, USV, UUV, SAWS
Human-out-of-the-loop	ARS that can select targets and deliver force without any human input or interaction.	AWS

Table 2: Classifications of ARS.

Automated and Automatic Weapons

One final distinction regarding weapon system technologies must be made, and that is the category of weapons which are known as automated and automatic weapons (AAW). AAW are neither ARS, nor are they LAWS. They are weaponized systems which operate on the basis of ‘if, then’ statements which are programmed into their operating systems, and they do not operate on the basis of AI. Instead, they are entirely dependent on event sequences, much like an assembly line process; they are automated, but not autonomous, requiring conditions to be met prior to initiating the next step in the event sequence. One example of this type of weapon is the Soviet – and now Russian – Perimeter system. The Perimeter weapon, and other weapons of similar nature, cannot be categorized as autonomous²⁰ because the system does not possess the ability to make decisions independently of human operations and input; it may only act according to parameters within which it has been designated to operate, all of which are pre-determined by human operators. The Perimeter system operates so that should all of the ‘if, then’ qualifications are fulfilled, it will take a pre-determined action, as opposed to making an independent choice.

²⁰ According to Dr. Vadim Kozyulin, PIR Center Project Director for New Technologies and International Security, Professor, Academy of Military Sciences of the Russian Federation.

Kozyulin argues that missile defense systems would fall into this category as well, but agreement internationally, like with LAWS, is incomplete.²¹

As demonstrated, there are various categories of ARS which fall into the category of LAWS, but there are also those which do not. Moreover, the areas of overlap between definitions and understandings of SAWS and AWS, such as being on- or out-of-the-loop, exemplify the challenges facing the international community regarding the regulation and governance of these technologies. When speaking of LAWS, all of the aforementioned categories, with the exception of automated and automatic weapons, fall into this classification.

Type of Autonomous Robotic System (ARS)	“Loop” Classification(s)
Drone	Human-in-the-loop, Human-on-the-loop
UCAV: Unmanned Combat Aerial Vehicle	Human-in-the-loop, Human-on-the-loop
UGCV: Unmanned Ground Combat Vehicle	Human-in-the-loop, Human-on-the-loop
USV: Unmanned Surface Vehicle	Human-in-the-loop, Human-on-the-loop
UUV: Unmanned Underwater Vehicle	Human-in-the-loop, Human-on-the-loop
SAWS: Semi-Autonomous Weapon System	Human-in-the-loop, Human-on-the-loop
AWS: Autonomous Weapon System	Human-out-of-the-loop

Table 2: Types of Autonomous Robotic Systems and “Loop” Classification(s).

²¹ Kozyulin, VB, 2019. Deadly autonomous weapons systems: problems of modern international legal regulation and prospects for their solution. *International Life*, (2), pp. 82-94. <http://www.intelros.ru/readroom/mezhdunarodnaya-zhizn/m2-2019/37913-smertonosnye-avtonomnye-sistemy-vooruzheniy-problemy-sovremennogo-mezhdunarodno-pravovogo-regulirovaniya-i-perspektivy-ih-resheniya.html>.

Non-Codified Classification of Autonomous Robotic Systems

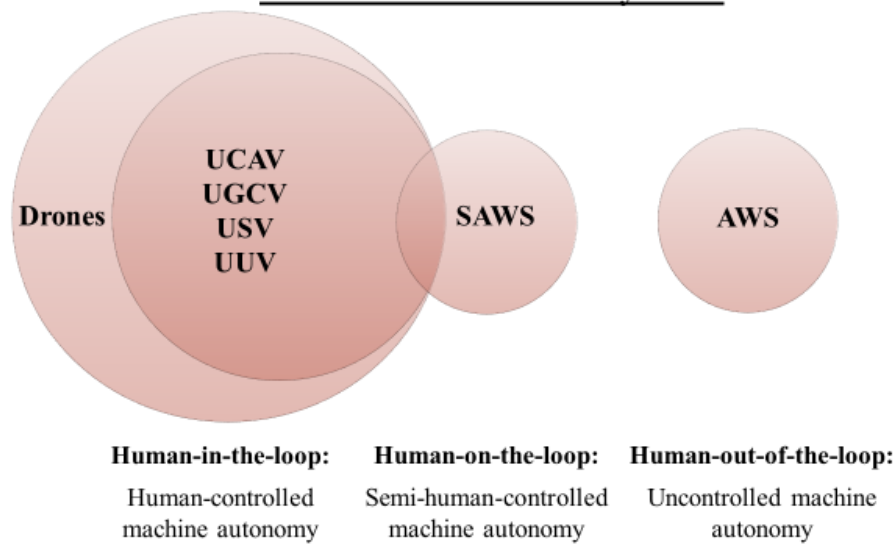


Figure 2: Non-Codified Classifications of Autonomous Robotic Systems.

RESULTS

Currently, various aspects of international law could and should be applied to AWS, particularly of the LAWS variety. However, there is no official governance mechanism designed to address the functional capabilities of these systems. As such, a variety of legal frameworks are examined here to serve as a system for possible global governance. Moreover, the Russian Federation's policy regarding AWS, ultimately, is quite extensive. It employs cooperation between the public and private sectors for purposes of military and non-military functions; it proposes specific governance mechanisms – even as they reject more widely-held governance proposals – for autonomous systems, but not AI broadly; it has promoted the development of AI domestically from the highest levels of government and armed forces alike; and, it has dedicated academic and monetary capital to the development of AI systems. This section first evaluates legal frameworks and then delves into the Russia case study.

Existing and Emerging Governance Frameworks

Overall, ARS encompass a multitude of capacities and span various levels of autonomy, and the classification of LAWS, being far from agreed upon, makes governance all the more difficult. Currently, analyses regarding LAWS examine its compliance with different aspects of international law, especially adherence to International Humanitarian Law (IHL), but also to International Human Rights Law (IHRL), which together comprise the Law of Armed Conflict (LOAC). LAWS are being discussed by the Group of Governmental Experts (GGE) at the United Nations Conference of the High Contracting Parties to the Convention on Certain Conventional Weapons (CCW), and they also face issues of legality from the Responsibility of States for Internationally Wrongful Acts. The largest issues of compliance with international law revolve

around LAWS which would fall into the category of “human-out-of-the-loop,” and the following areas in question provide a backdrop against which the Russian Federation’s policy can be examined.

Compliance with International Humanitarian Law

The primary area of concern for the legality of LAWS and their use falls into IHL, or *jus in bello*, the rules which govern the waging of war between parties in armed conflict.²² While not the only area of concern, IHL’s principles pose numerous challenges for the development and application of LAWS. Those principles, outlined by the Declaration of St. Petersburg of 1868 and the Martens Clause within the Preamble of the 1899 Hague Convention, are distinction, proportionality, the prevention of unnecessary suffering, the laws of humanity, and the dictates of public conscience. LAWS also face issues of legality when examined in the context of the principle of military necessity and Article 36 of Additional Protocol I to the Geneva Conventions.

Declaration of St. Petersburg: Distinction

The principle of distinction is accepted as customary principle of IHL, and it requires armed forces to distinguish between noncombatants and combatants and civilian objects and military objectives. Consequently, this renders the attacking of noncombatants and civilian objects illegal under IHL.²³ Given that the nature of conflict has shifted from the battlefield between states to asymmetric urban warfare²⁴ settings between armed non-state groups and the states they seek to destabilize, distinction poses one of the most difficult hurdles for LAWS to clear in order to be

²² International Committee of the Red Cross. 2010. Jus ad bellum and jus in bello. October 29, 2010. <https://www.icrc.org/en/document/jus-ad-bellum-jus-in-bello>.

²³ ICRC Casebook. N.d. Distinction. N.d. <https://casebook.icrc.org/glossary/distinction>.

²⁴ Rupert Smith is the leading scholar on this, having coined the term “war amongst the people.”

acceptable under IHL. For example, the ability of a LAWS to distinguish between a civilian and a combatant would likely prove extremely difficult, as there are no physical indicators differentiating a combatant from a civilian. Given the constraints of technologies surrounding behavior, body language, and expression, a LAWS might not only fail to identify a legal target, but rather, it might incorrectly target a civilian that it believes is a combatant instead.²⁵

Additionally, the absence of emotion and human connection from LAWS might contribute to its inability to respect and adhere to distinction. Frightened individuals, children holding toy guns running around, and other actions which a human could understand as non-threatening could in fact provoke the use of force from LAWS, when a human soldier could recognize that those individuals are not threats or valid targets.^{26 27} In particular, a LAWS of “human-out-of-the-loop” categorization would have the highest likelihood of violating this customary principle given the absence of human decision-making.

Declaration of St. Petersburg: Proportionality

Proportionality, the second customary principle of IHL, is another barrier to the legal use of LAWS within the current international legal system. Citing the US Air Force’s understanding of proportionality, Docherty writes that it would be nearly impossible for a LAWS to be programmed to handle the multitude of scenarios regarding the proportionality of an attack, particularly because an attack must not render more harm to civilians than it is militarily useful for

²⁵ Krishnan, A., *Killer Robots: Legality and Ethicality of Autonomous Weapons* (Surrey, UK: Ashgate Publishing Limited, 2009). Page 99.

²⁶ Docherty, B., 2012. *Losing humanity: The case against killer robots*. Human Rights Watch. Pages 31-32.

²⁷ It is worth noting that a human soldier might also make the mistake of using force against invalid targets. This raises the issue of State Responsibility, which will be addressed later.

the achievement of military objectives.²⁸ The possibility of a machine utilizing an algorithm to determine the legality of an attack disregards the need for human judgement in the observance of proportionality. The ICRC explains in commentary that there is a “broad margin” for decision-making and needs to employ “common sense and good faith.”²⁹ Essential to this understanding of proportionality is that humans are the best-equipped to make value judgements and to consider the multitude of considerations in determining the proportionality of an attack. While a LAWS of “human-out-of-the-loop” classification at some point might possess the technology to make those judgements, it currently remains irresponsible and unrealistic to consider the available technological systems rendering the appropriate decisions in the wide variety of possible situations in which an attack could occur.

Declaration of St. Petersburg: Prevention of Unnecessary Suffering

The third customary principle from the Declaration of St. Petersburg is that of the prevention of unnecessary suffering. This customary principle, which is explained through Rule 47 of the ICRC’s IHL Database, explains that any individual who is defenseless and clearly expressing the will to surrender, or, an individual who is injured or militarily incapacitated and expressing the will to surrender, cannot be targeted by the use of force.³⁰ This, similar to distinction and proportionality, requires judgement that would be difficult for a LAWS to adhere to, as it requires judgement and observation based on social cues, body language, and behavior that an

²⁸ Docherty, B., 2012. *Losing humanity: The case against killer robots*. Human Rights Watch. Page 32.

²⁹ ICRC, Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949, https://www.loc.gov/rr/frd/Military_Law/pdf/Commentary_GC_Protocols.pdf. Page 679, 682.

³⁰ ICRC IHL Database: Customary IHL. “Rule 47. Attacks against persons hors de combat.” https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_cha_chapter15_rule47.

algorithm might not be able to respect and adhere. Specifically, in the event that a combatant becomes injured by a LAWS, the LAWS would need to make a value judgement that said individual matched the specifications of an *hors de combat*, who would no longer be a valid military target. In this case, on a large scale, LAWS could violate IHL in numerous situations where human judgement would otherwise be valuable and necessary to prevent such a violation. As such, this remains a major stumbling block for LAWS of the categorization of “human-out-of-the-loop,” raising the issue of whether any future technology would possess the same capacity for critical thinking as a human.

Martens Clause: Principles of Humanity and Dictates of Public Conscience

The Martens Clause states that where the laws of war are incomplete or under development in terms of codified international law, the conduct of states should be measured by “principles of humanity” and the “dictates of public conscience.”³¹ As such, LAWS should be reviewed in terms of legality, according to opponents of the systems. While there is no official definition of either of these phrases, arguments have included measuring the amount of human control over a weapon system and public opinion’s support for types of weapons, although neither of these arguments of these have legal weight. Regarding human control, support for LAWS is lower when human control over the weaponry is lower as well, while support for LAWS is higher when humans have more control over the systems.³² Issues about human control, and the lack thereof, over LAWS appear to raise resistance from civilians, as the ability to make “life-and-death-decisions...shocks the conscience.”³³ Separately, a study released by Ipsos in 2019 on behalf of HRW for the

³¹ ICRC Casebook. N.d. Martens Clause. N.d. <https://casebook.icrc.org/glossary/martens-clause>.

³² Docherty, B., 2012. *Losing humanity: The case against killer robots*. Human Rights Watch. Page 36.

³³ *Ibid.*

Campaign to Stop Killer Robots, 61% of adults surveyed across 26 countries opposed the use of LAWS.³⁴ Public opinion seems to be against LAWS' use, and even as the polls bear no legal obligation for states, the “dictates of public conscience” appear to be against the weapons. In any event, LAWS' capacity to fulfill the parameters of the Martens Clause appears ambiguous at best, and as the debate over these weapons becomes more prevalent with the exposure and development of the technologies needed to make LAWS of “human-out-of-the-loop” a reality, it is reasonable to predict public conscience will become more opposed to such weapon systems.

Military Necessity

According to the ICRC, military necessity allows measures which are “actually necessary to accomplish a legitimate military purpose and are not otherwise prohibited by international humanitarian law.”³⁵ However, the means which can be taken to achieve a “legitimate military purpose” are limited by the constraints of “humanity” and human judgement.³⁶ Military necessity as a principle of IHL, like proportionality and distinction, requires contextual assessments which could prove quite difficult for a LAWS to abide by, and in the case that it could not conduct itself appropriately, a LAWS – or more realistically, swarms of LAWS – could make a severe miscalculation of necessity resulting in a massive violation of IHL. Armed conflict being

³⁴ Deeney, C., 2019. Six in Ten (61%) Respondents Across 26 Countries Oppose the Use of Lethal Autonomous Weapons Systems. Ipsos and HRW for the Campaign to Stop Killer Robots. January 21, 2019. <https://www.ipsos.com/en-us/news-polls/human-rights-watch-six-in-ten-oppose-autonomous-weapons>.

³⁵ ICRC Casebook. N.d. Military Necessity. N.d. <https://casebook.icrc.org/glossary/military-necessity>.

³⁶ Docherty, B., 2012. *Losing humanity: The case against killer robots*. Human Rights Watch. Page 34.

“dominated by machines...could have disastrous consequences,” thereby justifying a preemptive restriction to some opponents of LAWS.³⁷

Article 36 of Additional Protocol I to the Geneva Conventions

Article 36 of Additional Protocol I to the Geneva Conventions iterates that when in the process of “study, development, acquisition or adoption of a new weapon, means or method of war,” state parties must determine if said weapon, means, or method would be prohibited by international law, the Protocol, or other applicable international law to the state parties.³⁸ While no official review process exists, the ICRC has produced a guide further explaining the measures states ought to take when evaluating the legality of an emerging weapon, means or method of warfare.³⁹ LAWS, particularly those of the “human-out-of-the-loop” distinction, face intense scrutiny due to the issue of accountability.⁴⁰

Compliance with International Human Rights Law

Separate from principles of IHL, there is one aspect of IHRL in particular which raises questions about LAWS, and that is Article 9 of the International Covenant on Civil and Political Rights, the right to life. IHRL, which regulates how force may be used, *jus ad bellum*, can be

³⁷ Ibid, 35.

³⁸ Article 36 of Additional Protocol I to the Geneva Conventions codifies this rule. Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), adopted June 8, 1977, 1125 U.N.T.S. 3, entered into force December 7, 1978, art. 36.

<https://treaties.un.org/doc/Publication/UNTS/Volume%201125/volume-1125-I-17512-English.pdf>

³⁹ See: ICRC, A Guide to the Legal Review of New Weapons, Means and Methods of Warfare: Measures to Implement Article 36 of Additional Protocol I of 1977 (Geneva: ICRC, 2006), http://www.icrc.org/eng/assets/files/other/icrc_002_0902.pdf.

⁴⁰ This will be addressed in the section on State Responsibility.

waived during situations of armed conflict, when IHL applies, but “certain fundamental rights” cannot be waived, including the right to life.⁴¹ The right to life, from which no derogation is allowed, still applies in times of armed conflict. As such, the ability of LAWS to adhere to this principle is challenged in ways similar to the issues raised regarding distinction and proportionality, especially for a “human-out-of-the-loop” system. The possible inability of a LAWS to appropriately respect the lives of noncombatants prompts skepticism about whether or not it would be able to observe this peremptory norm.

Discussion for Regulation of LAWS within the CCW by the GGE

Since 2014, the international community has attempted to establish a framework of regulation for the use of the newest developments in the area of technologies pertaining to LAWS, but consensus has been reached neither at the level of the United Nations nor between states on a bi- or multilateral level. With the establishment of the GGE on emerging technologies in the area of LAWS within the CCW in 2016, the discussion of regulating LAWS at the UN was officially launched. The CCW in particular makes reference to the principles of restricting methods and means of warfare to those which do not cause superfluous injury or unnecessary suffering.⁴² Given the possible nature of LAWS, the creation of the GGE was deemed appropriate for addressing the issue of LAWS’ regulation within the international system and to define the weaponry to make said regulation possible. However, the Group has been stuck attempting to determine definitions

⁴¹ ICRC, 2010. IHL and human rights law. October 29, 2010.

<https://www.icrc.org/en/document/ihl-human-rights-law>.

⁴² United Nations, *Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects (and Protocols) (As Amended on 21 December 2001)*, 10 October 1980, 1342 UNTS 137.

[https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/40BDE99D98467348C12571DE0060141E/\\$file/CCW+text.pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/40BDE99D98467348C12571DE0060141E/$file/CCW+text.pdf).

of LAWS for the past three sessions, spanning 2017-2019.⁴³ In 2019, the Group took guiding principles from 2018 and built upon them further, but failed to take any determinative action regarding the definition of LAWS.⁴⁴ The GGE did, however, enumerate one additional guiding principle to its work, specifically that:

“Human-machine interaction, which may take various forms and be implemented at various stages of the life cycle of a weapon, should ensure that the potential use of weapons systems based on emerging technologies in the area of lethal autonomous weapons systems is in compliance with applicable international law, in particular International Humanitarian Law (IHL). In determining the quality and extent of human-machine interaction, a range of factors should be considered including the operational context, and the characteristics and capabilities of the weapons system as a whole.”⁴⁵

While not successful in terms of reaching a definition for LAWS, the GGE did manage to cover a plethora of subjects with this new guiding principle, particularly the extent of autonomy, the object and purpose of the weapons, and the various functions and manners of operations of the weapons, as well. This is significant, as a major stumbling block among the members of the GGE has been determining the necessary scope and presence of human autonomy and decision-making regarding the use of force in the context of LAWS. The GGE also touched upon the necessity for compliance with IHL’s principles of distinction, proportionality, and precautions in attack; the obligations of states to follow IHL with the use of any weaponry; the essential nature of human judgement in the use of force; the prohibition of weapons violating prohibitions of unnecessary suffering and superfluous injury; the necessity of legal reviews and best practices for conducting

⁴³ World Economic Forum, 2017. The Global Risks Report 2017, 12th Edition. http://www3.weforum.org/docs/GRR17_Report_web.pdf.

⁴⁴ Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons System. 2019. Report of the 2019 Session of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems. 25 September 2019. <https://undocs.org/en/CCW/GGE.1/2019/3>. Page 3.

⁴⁵ Ibid, 3-4.

them for emerging weapons technologies; the processes for identification, selection, and engagement of a target by LAWS; the understanding that human involvement in LAWS' operations does not necessarily denote legality of the weaponry; the opportunity for innovation of technologies even as LAWS face regulation; the disputed efficacy of LAWS aiding or impeding decision-making of human commanders; and the unknown quantity of risk created through the proliferation of any LAWS to non-state groups seeking to use them against populations.⁴⁶

A major impediment facing the GGE, however, is that there are no set timeframes regarding deliverable conclusions on the parameters which these principles and ideas address. As a result, any governance mechanism or agreement of definitions could occur well past the point of development of LAWS of the “human-out-of-the-loop” capacity. The GGE could meet for quite some time and never arrive at a decisive point of discussion on any of these fundamental issues. This exemplifies one of the profound shortcomings of the current governance system for LAWS, and it remains to be seen how it will progress in time to face the challenges of global governance for these emerging technologies.

State Responsibility

Within the International Law Commission's Draft Articles on Responsibility of States for Internationally Wrongful Acts (Draft Articles), the stipulation that states be held accountable for wrongful acts is outlined, and the culpability of states for those acts is stipulated.⁴⁷ However, the Draft Articles explicitly refer to violations of law and obligations by a “person” or “entity” of a

⁴⁶ Ibid, 4-6.

⁴⁷ The Draft Articles on Responsibility of States for Internationally Wrongful Acts. The Draft Articles on Responsibility of States for Internationally Wrongful Acts. Adopted by the International Law Commission at its fifty-third session (2001).
https://legal.un.org/ilc/texts/instruments/english/draft_articles/9_6_2001.pdf.

state, raising concerns about the ability to attribute violations to a LAWS, which is clearly neither a legal person under international law nor an entity of the state which possesses legal personality.⁴⁸ As such, LAWS, pose a challenge to international law in terms of violations of the aforementioned obligations, as well as others due to the absence of a chain of command or accountability mechanism for a LAWS which acts illegally.⁴⁹ Moreover, this issue is complicated by the presence of cyber threats. Even proponents of LAWS acknowledge that “The one real risk is tampering by the enemy or non-State actors such as hackers” who could direct LAWS against “a civilian population,” thereby committing a violation of international law.⁵⁰ This raises serious legal questions, such as 1) whether or not the state which had its systems hacked could face culpability for its failure to take appropriate precautions and adopt adequate cyber-protection measures for its technologies, 2) if any individual of the state which owns the technology would be punished instead of any hacker, 3) if a state could feign a hack in order not to be culpable for a violation, and numerous other related questions. Current international law cannot answer these questions, but the Draft Articles make it clear that there is culpability for internationally wrongful acts. The potential for current international legal mechanisms to be taken advantage of is high, and without proper additions surrounding LAWS and the required oversight for these new technologies, it is not difficult to speculate the ways in which international law could be flaunted or fail to fulfill its

⁴⁸ Ibid.

⁴⁹ Garcia, D. 2014. “The Case Against Killer Robots.” Foreign Affairs. May 10, 2014.

<https://www.foreignaffairs.com/articles/united-states/2014-05-10/case-against-killer-robots>.

⁵⁰ Schmitt, M.N. and Thurnher, J.S., 2012. Out of the loop: autonomous weapon systems and the law of armed conflict. Harv. Nat'l Sec. J., 4, p.242.

https://heinonline.org/HOL/Page?handle=hein.journals/harvardnsj4&div=8&g_sent=1&casa_token=wvxC7owmtcMAAAA:3XedoKo5mxTjv0SsISII-jK-E7ysM7Lpq3J9_-lvH9jPC5oMY7wFMRTZbWeFlif0U61PLPMJIQ&collection=journals.

object and purpose. The largest question facing LAWS is who will indeed be culpable for any violations, and the Draft Articles raise that question quite poignantly.

Case Study: The Russian Federation

The Early Days: Pre-2017

As the Russian Federation does not possess an explicit document detailing how and in what capacity LAWS will be developed and applied, an investigation of actions taken by the state is necessary. In 2014, Russian armed forces conducted war games with “the participation of new Platform-M combat robots”⁵¹ in the Baltic Sea region around the same time NATO was conducting exercises in the region as well. This marked a distinct shift in Russia’s wargames, which previously had not featured any ARS. The Platform-M, developed by the Russian company Sitemprom, could target without human assistance, operating as one of the earliest “human-in-the-loop” systems.⁵² A UGCV, its functions also included intelligence gathering, discovery and elimination of stationary and mobile targets, patrols, and firepower support, demonstrating a wide array of uses and purposes.⁵³ Moreover, this marked the announcement of a policy objective by the Russian military, as 30% of military technology in the Russian Armed Forces would be expected to consist of robotic hardware by 2025, beginning in 2016.⁵⁴ However, that policy was developed with the understanding that Russia was technologically behind its Western and American counterparts by

⁵¹ Korolkov, A., 2014. "New Combat Robot is Russian Army's Very Own Deadly WALL-E." July 2, 2014. https://www.rbth.com/defence/2014/07/02/new_combat_robot_is_russian_armys_very_own_deadly_wall-e_37871.html.

⁵² 2015: Gady, Franz-Stefan. 2015. *Meet Russia's New Killer Robot*. The Diplomat. Viewed 6 December 2019. <<https://thediplomat.com/2015/07/meet-russias-new-killer-robot/>>.

⁵³ Ibid.

⁵⁴ Ibid.

about 20 years in developing ARS.⁵⁵ As a result, Russia would go on to allocate substantial resources⁵⁶ – \$346 billion⁵⁷ – to the plan in hopes to make up ground by the end of the 10 year period. This first step, however, with the Platform-M robot, demonstrated the creation of public-private partnerships in the area of autonomous systems, and the 10 year plan marked an ambitious agenda for Russia’s military.

The Future for All Humankind

In 2017, however, activity in the realm of autonomous systems began taking off. On Russian Knowledge Day, on which the Russian president marks the beginning of the academic year with a speech on the nation’s educational goals and aspirations, Russian President Vladimir Putin stated that “whoever becomes the leader in [AI] will become the ruler of the world,” as AI “is the future, not only for Russia, but for all humankind. It comes with colossal opportunities but also threats that are difficult to predict.”⁵⁸ Given the prevalence of the speech and the nearly universal viewership and coverage in Russia, it signified a prominent tack towards the development of technologies between the government and civil society.

At the same time, the Russian Federation, as a member of the CCW’s GGE, began resisting the desire of a majority of states within the GGE to define LAWS on the basis that LAWS did not

⁵⁵ Ibid.

⁵⁶ Ibid.

⁵⁷ Haner, J. and Garcia, D., 2019. The Artificial Intelligence Arms Race: Trends and World Leaders in Autonomous Weapons Development. *Global Policy*, 10(3), pp.331-337. Viewed 22 November 2019. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/1758-5899.12713>.

⁵⁸ Russia Today. 2017. *'Whoever leads in AI will rule the world': Putin to Russian children on Knowledge Day*. TV-Novosti. Viewed 16 November 2019. <https://www.rt.com/news/401731-ai-rule-world-putin/>.

yet exist,⁵⁹ noting that the “understanding of LAWS largely depends on the interpretation of each delegation.”⁶⁰ This, according to Paul Scharre, Senior Fellow and Director of the Technology and National Security Program at the Center for New American Security, gives Russia an “incongruous” position, as its “own defense companies have made claims about developing autonomous weapons.”⁶¹ The Kronstadt Group’s CEO Armen Isaakyan, for instance stated in an interview with TASS that “there already exist completely autonomous AI operation systems that provide the means for UAV clusters,” bringing skepticism to Russia’s statements.⁶² However, the United Nations Office of Disarmament Affairs echoed part of Russia’s statement, agreeing that “there is no international agreed formal definition for LAWS” and that “definitions will likely play a key role in international deliberations on this issue.”⁶³ Russia added to this with a statement saying that the work for a definition and progress within the GGE “should be done on the step-by-

⁵⁹ Russian Federation. 2017. Statement by the Russian Delegation on Agenda Item 8 of the Meeting of the States Parties to the Convention on Certain Conventional Weapons: Consideration of the Report of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems. The Delegation of the Russian Federation to the Group of Governmental Experts of the High Contracting Parties to the Convention on Certain Conventional Weapons. Viewed 16 November 2019.

[https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/37365361B9432DC2C125823B00418F0C/\\$file/2017_GGE+LAWS_Statement_Russia.pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/37365361B9432DC2C125823B00418F0C/$file/2017_GGE+LAWS_Statement_Russia.pdf).

⁶⁰ Ibid.

⁶¹ Tucker, Patrick. 2017. Russia to the United Nations: Don’t Try to Stop Us From Building Killer Robots. Defense One. Viewed 17 November 2019.

<https://www.defenseone.com/technology/2017/11/russia-united-nations-dont-try-stop-us-building-killer-robots/142734/?oref=d1-in-article>.

⁶² 2017. “Russia is developing artificial intelligence for military and civilian drones.” TASS. Viewed March 30, 2020. <https://tass.com/defense/945950>.

⁶³ United Nations Office of Disarmament Affairs. 2017. *Perspectives on Lethal Autonomous Weapon Systems*. United Nations Office of Disarmament Affairs Occasional Papers. Viewed 16 November 2019.

[https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/6866E44ADB996042C12581D400630B9A/\\$file/op30.pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/6866E44ADB996042C12581D400630B9A/$file/op30.pdf).

step basis...gradually...[and] not to...hurry but rather underline the substance.”⁶⁴ Russia also alluded to the possibility that a far-reaching preemptive ban on LAWS technologies could stifle the development of other AI technologies for civilian use, however, the points made by the Russian Federation during the sessions were seen as undermining progress toward a ban in order to serve Russia’s interests.⁶⁵ In any case, Russian companies had been attempting to develop – if not successfully developing – LAWS, making Russia’s statement appear disingenuous to some members of the discussion group, as it cautioned against unclear distinctions between civilian and military developments of autonomous systems.⁶⁶

A few development examples within the Russian military included the production and deployment of Glider 2.0 robots, Sea Shadow, and unmanned nuclear submarines, all of which are UUV systems.⁶⁷ Glider 2.0 possessed the capacity to deploy for 6-9 months without interruption, engage in reconnaissance, and venture into deep-sea areas without support vessels,⁶⁸ while the Sea Shadow’s purpose was to conduct oceanographic research and collect and process “large amounts

⁶⁴ Russian Federation. 2017. Statement by the Russian Delegation on Agenda Item 8 of the Meeting of the States Parties to the Convention on Certain Conventional Weapons: Consideration of the Report of the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems. The Delegation of the Russian Federation to the Group of Governmental Experts of the High Contracting Parties to the Convention on Certain Conventional Weapons. Viewed 16 November 2019. [https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/37365361B9432DC2C125823B00418F0C/\\$file/2017_GGE+LAWS_Statement_Russia.pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/37365361B9432DC2C125823B00418F0C/$file/2017_GGE+LAWS_Statement_Russia.pdf).

⁶⁵ Tucker, Patrick. 2017. Russia to the United Nations: Don’t Try to Stop Us From Building Killer Robots. Defense One. Viewed 17 November 2019. <https://www.defenseone.com/technology/2017/11/russia-united-nations-dont-try-stop-us-building-killer-robots/142734/?oref=d1-in-article>.

⁶⁶ Ibid.

⁶⁷ Bendett, S., 2017. *Red Robots Rising: Behind the Rapid Development of Russian unmanned Military Systems*. The Strategy Bridge. Viewed 22 November 2019. <https://thestrategybridge.org/the-bridge/2017/12/12/red-robots-rising-behind-the-rapid-development-of-russian-unmanned-military-systems>.

⁶⁸ Ibid.

of information.”⁶⁹ Meanwhile, the unmanned nuclear submarines portended a smaller role for more conventional military and defense purposes, as the system would reduce the amount of personnel on board and allow the Russian Navy to allocate resources elsewhere, demonstrating a revision, if not upgrading, of its capacity to project conventional force efficiently.⁷⁰ Separately, Russia also imported USV systems, including the Inspector MK2, which possessed the capacity to operate autonomously for mine warfare activities and protection missions.⁷¹ Taken collectively, Russia’s trajectory with LAWS appeared to be diverse and open to development and application alike, although Russia also stated that it acknowledged the need for “meaningful human control,”⁷² even though it was “poorly developed.”⁷³ Regardless of this, however, is that the Russian government views these modern military developments as pivotal in achieving foreign policy objectives, and by devoting academic, industrial, and military resources to the development of ARS, it believes it might be able to succeed faster than its competitors in Asia and the West.⁷⁴

⁶⁹ Ibid.

⁷⁰ 2018. “Latest Details on Russia's Husky Fifth-Generation Submarine.” Navy Recognition. <https://www.navyrecognition.com/index.php/news/defence-news/2018/june-2018-navy-naval-defense-news/6277-latest-details-on-russia-s-husky-fifth-generation-submarine.html>.

⁷¹ Ibid.

⁷² Bendett, S., 2017. *Red Robots Rising: Behind the Rapid Development of Russian unmanned Military Systems*. The Strategy Bridge. Viewed 22 November 2019.

<https://thestrategybridge.org/the-bridge/2017/12/12/red-robots-rising-behind-the-rapid-development-of-russian-unmanned-military-systems>.

⁷³ Delegation of the Russian Federation to the Group of Governmental Experts of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, 2017. *Examination of various dimensions of emerging technologies in the area of lethal autonomous weapons systems, in the context of the objectives and purposes of the Convention*. Page 3.

[https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/2C67D752B299E6A7C12581D400661C98/\\$file/2017_GGEonLAWS_WP8_RussianFederation.pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/2C67D752B299E6A7C12581D400661C98/$file/2017_GGEonLAWS_WP8_RussianFederation.pdf).

⁷⁴ Bendett, S., 2017. *Red Robots Rising: Behind the Rapid Development of Russian unmanned Military Systems*. The Strategy Bridge. Viewed 22 November 2019.

<https://thestrategybridge.org/the-bridge/2017/12/12/red-robots-rising-behind-the-rapid-development-of-russian-unmanned-military-systems>.

For the National Interest

In 2018, President Putin echoed these efforts, stating that “research and development in the field of defense technology is of utmost importance to us” since it guarantees security of the country and the potential for civilian development.⁷⁵ Across the world, the US’ Department of Defense took note, warning of an “intercontinental, nuclear-armed, undersea autonomous torpedo” in its Pre-Decisional Nuclear Posture Review,⁷⁶ as well as its final Nuclear Posture Review, demonstrating the level of commitment Russia had to the initiative to the US.⁷⁷ On top of this, the Pentagon reported that Moscow was prioritizing UGCV systems, having already sent its most up-to-date model to Syria at the time.⁷⁸ The Uran-9, which was constructed by Rostec, could only make the decision to fire with human permission, but possessed anti-tank missiles and a variety of other weapons for various functions.⁷⁹ While the machine experienced issues in urban environments and reportedly did experience technical issues impeding use, its deployment marked utilization of a project which only recently had begun, demonstrating the speed at which Russia was able to develop and deploy such weapons, even if not wholly successfully.

⁷⁵ (Translated from Russian to English) No author. 2018. *Putin spoke about the introduction of artificial intelligence in military affairs*. Izvestia. Viewed 17 November 2019. <https://iz.ru/745150/2018-05-18/putin-rasskazal-o-vnedrenii-iskusstvennogo-intellekta-v-voennoe-delo>.

⁷⁶ United States Department of Defense. 2018. Nuclear Posture Review. (Pre-Decisional). Pages 5-6. Viewed 16 November 2019. <<https://fas.org/nuke/guide/usa/npr2018-draft.pdf>>.

⁷⁷ Office of the Secretary of Defense. 2018. Nuclear Posture Review. Department of Defense. Viewed 22 November 2019. Page 9. <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>.

⁷⁸ Apps, Peter. 2019. Commentary: Are China, Russia winning the AI arms race? Reuters News. Viewed 16 November 2019. <https://www.reuters.com/article/us-apps-ai-commentary/commentary-are-china-russia-winning-the-ai-arms-race-idUSKCN1P91NM>.

⁷⁹ Roblin, S., 2019. “This is the Robot Russia Used in Syria.” The National Interest. <https://nationalinterest.org/blog/buzz/robot-tank-russia-used-syria-89866>.

Defense Minister of the Russian Federation, Sergey Shoygu, made statements of similar nature in March of 2018. He noted that the Russian military is already implementing, “energetically,” changes to the role of soldiers in the Russian armed forces which would see most combat operations “be conducted by remote-controlled vehicles,” as opposed to “in the near future.”⁸⁰ Shoygu noted further that the Russian military had over 1800 robots operating, which was an increase of more than ten times from simply a few years ago.⁸¹ These statements, in turn, were mirrored by Mikhail Medvedev, the director of a robotics institute at the Southern Federal University in Russia’s Rostov Oblast, who reiterated that by 2030, the Russian military would largely be comprised of autonomous robots, while humans would still make the decision to fire a weapon in the appropriate circumstances.⁸² This reflects Russia’s desire to lead in AI, as it considers itself locked in a “technological arms race,”⁸³ thereby using any tool of development – university, military, or otherwise – to accomplish that goal. Even more directly, however, Shoygu called on the Ministry of Defense and civilian scientists, particularly the Russian Academy of Sciences, to work in unison to develop robotic and drone technologies,⁸⁴ making the collaboration quite clear across all levels, especially as 37 enterprises⁸⁵ have been working towards projects in robotics, information systems and nanotechnology, among other sectors such as AI, under a

⁸⁰ TASS. 2018. *Combat robots for Russian troops to go into serial production this year — defense minister*. TASS. Viewed 17 November 2019. <<https://tass.com/defense/945950>>.

⁸¹ Ibid.

⁸² Atherton, Kelsey. 2018. Russian roboticist sees all-but-lethal autonomous weapon systems by 2030. C4ISRNET. Viewed 16 November 2019. <https://www.c4isrnet.com/unmanned/2018/09/17/russian-roboticist-sees-all-but-lethal-autonomous-weapon-systems-by-2030/>.

⁸³ Ibid.

⁸⁴ TASS. 2018. "Shoigu Called on Military and Civilian Scientists to Jointly Develop Robots and Drones." March 14, 2018. <https://tass.ru/armiya-i-opk/5028777>.

⁸⁵ Including Kurchatov Institute, Kalashnikov, Sukhoi, Vega, and Uralvagonzavod.

presidential decree on 48 projects.⁸⁶ This symbiosis between the Russian state and civil society further appears when considering the outlook of Valery Gerasimov, General of the Russian Army, who believes that “the main features of future conflicts will be the widespread use of high-precision and other types of weapons, including robotic ones.”⁸⁷ This added weight to Russia’s push to harness all facets of society in order to develop new technologies for warfare, especially as it tried to slow down the regulation process.

The Governance Gambit

Later in 2018, Russia went on to block a two-week proposal for deliberations on LAWS within the CCW’s GGE, stating that its “delegation cannot agree with the alarmist assessments predicting that fully autonomous weapon systems will inevitably emerge in the coming years” and that the entire forum was a “waste of time and money because no one is actually developing these weapons.”⁸⁸ This stirred strong disapproval from many states, but given that the GGE must act by consensus, Russia was able to veto such a direction within the Group.⁸⁹ In any event, ex-Advisor to the Department of Non-Proliferation and Arms Control of the Russian Ministry of Foreign Affairs, Andrey Malov, iterated that the understanding of LAWS, must be informed by each country’s, international organization’s, and non-governmental organization’s understanding of

⁸⁶ Galanina, Angelina, Dmitry Ludmirsky, Roman Kretsul. 2018. Weapons of the mind: the Russian path to military artificial intelligence (translated). Izvestia. Viewed 22 November 2019. <https://iz.ru/815370/angelina-galanina-dmitrii-liudmirskii-roman-kretcul/oruzhie-razuma-rossiiskii-put-k-voennomu-iskusstvennomu-intellektu>.

⁸⁷ 2018. The use of robots and the widespread use of precision weapons will become the main features of the wars of the future - chief of the General Staff of the Russian army. Interfax. Viewed 22 November 2019. <https://www.militarynews.ru/story.asp?rid=1&nid=476975&lang=RU>.

⁸⁸ Sharkey, Noel. 2018. Killer Robots from Russia without Love. Forbes. Viewed 16 November 2019. <https://www.forbes.com/sites/noelsharkey/2018/11/28/killer-robots-from-russia-without-love/#51b5501acf01>.

⁸⁹ Ibid.

LAWS terminology, considering the governance process, but that the picture is “quite chaotic,” making Russia’s ‘veto’ of the planned discussion not as harmful as otherwise viewed.⁹⁰ The possibility of reaching a definition would likely have been low, however, the move by Russia still was not welcomed by many Group members.

During the March session of the 2019 GGE meetings, however, Russia put forward a document with a proposed definition for LAWS as “unmanned technical means other than ordnance that are intended for carrying out combat and support missions without any involvement of the operator,” but did not include UAV systems within that definition and not mentioning USV or UUV systems at all.⁹¹ The document went on further to identify key areas of focus for the GGE and relevant international law, specifically distinction, proportionality, and Article 36 of the Additional Protocol to the Geneva Conventions, while also arguing that the role of humans, while an important limiting factor, should remain at the discretion of states.⁹² Russia’s positions, as enumerated in the document, outlined a noticeable shift in the language it was using to describe the need to regulate LAWS. In doing so, Russia proposed severely limiting the scope of the GGE’s work and having states conduct most of the regulation, more or less in good faith to obligations under international law, which would prove highly fortuitous for Russia’s ambitious development

⁹⁰ Kozyulin, Vadim. 2018. PIR CENTER EXPERTS ON THE PROHIBITION OF MILITARY ROBOTS. PIR Center. Viewed 22 11 November. <https://www.pircenter.org/en/news/7002-7785636>.

⁹¹ Russian Federation. 2019. Конвенция о запрещении или ограничении применения конкретных видов обычного оружия, которые могут считаться наносящими чрезмерные повреждения или имеющими неизбирательное действие [English unofficial translation: Potential opportunities and limitations of military uses of lethal autonomous weapons systems]. The Delegation of the Russian Federation to the Group of Governmental Experts of the High Contracting Parties to the Convention on Certain Conventional Weapons. Page 4. Viewed 16 November 2019. [https://www.unog.ch/80256EDD006B8954/\(httpAssets\)/B7C992A51A9FC8BFC12583BB00637BB9/\\$file/CCW.GGE.1.2019.WP.1_R+E.pdf](https://www.unog.ch/80256EDD006B8954/(httpAssets)/B7C992A51A9FC8BFC12583BB00637BB9/$file/CCW.GGE.1.2019.WP.1_R+E.pdf).

⁹² Ibid, 4-5.

plans for AI and ARS. However, Russian Security Council Secretary Nikolai Patrushev stated, referring to LAWS, just about one month later, that it was “necessary to activate the powers of the global community, chiefly at the UN venue, as quickly as possible to develop a comprehensive regulatory framework that would prevent...undermining national and international security,” raising questions about whether Russia was serious about regulations or simply trying to buy goodwill among members of the international community after its statements in March.⁹³ However, during an August session of the GGE, it appeared that Russia had only bought time and goodwill for the short term, stating that it would be “premature” to delve into the possible risks of LAWS “until they’re produced,” adding that “autonomy is not a characteristic or central feature” of LAWS.⁹⁴ On an even more obstructionist level, Russia undermined the Chair in attempting to reach a consensus on the draft report and would not participate in informal consultations, while attempting to walk back language agreed upon from previous sessions. Russia only would accept international being mentioned in the scope of IHL, and its delegation subsequently tried removing references to human control, ethics, and morality, while also trying to shift discussion to specific weapon systems from emerging technologies, the latter of which already was within the scope of the GGE’s discussions.⁹⁵

⁹³ Bendett, Samuel. 2019. Did Russia Just Concede a Need to Regulate Military AI? Defense One. Viewed 17 November 2019. <https://www.defenseone.com/ideas/2019/04/russian-military-finally-calling-ethics-artificial-intelligence/156553/>.

⁹⁴ Campaign to Stop Killer Robots. 2019. Russia, United States, attempt to legitimize killer robots. Campaign to Stop Killer Robots. Viewed 16 November 2019. <https://www.stopkillerrobots.org/2019/08/russia-united-states-attempt-to-legitimize-killer-robots/>.

⁹⁵ Acheson, Ray. 2019. Editorial: This cannot be kicked down the road any further. Reaching Critical Will. Viewed 22 November 2019. Page 2. <http://reachingcriticalwill.org/images/documents/Disarmament-fora/ccw/2019/gge/reports/CCWR7.6.pdf>.

Regardless of Russia's actions within the GGE, its actions outside of it spoke volumes as well, as Russia, in 2019, had moved to not only field autonomous icebreakers, but also to create "unmanned aerial vehicles for use in the Arctic," which could respectively be active for up to 60 and four days, respectively.⁹⁶ Plus, Russia views any technology which can give it an advantage in the Arctic, which it considers its own backyard, essential, and seeks to utilize it to project power in the region and solidify its position as the dominant Arctic power.⁹⁷ Moreover, the Russian government had also initiated use of a system "with artificial intelligence capable of destroying targets selected by pilots without their participation" on Mi-28N attack helicopters, according to TASS,⁹⁸ signifying Russia's attempts at bringing AI into the air as well. Ultimately, however, Russia's programs and pushes for intense AI development are severely limited by its extremely small budgetary resources, as Russia's "military spending on AI is estimated to be as low as \$12.5 million annually, just 0.01 per cent of the unclassified AI budget for the United States military."⁹⁹ This problem is compounded by, according to one survey from 2018, there only being 17 AI enterprises in all of Russia, compared to the over 100 in Israel, let alone the over 2000 in the US.¹⁰⁰

⁹⁶ Uppal, Rajesh. 2019. As Melting Ice Bringing Arctic into Geostrategic Prominence, Russia Quickly Establishes its Military Dominance Over it. IDST. Viewed 16 November 2019. <https://idstch.com/darpa-implementing-us-arctic-strategy-to-counter-russian-dominance-in-arctic/>.

⁹⁷ Samuel Bendett. 2019. Personal email correspondence. 18. November.

⁹⁸ Russian Aviation. 2019. New onboard system with AI on Mi-28N helicopters capable of destroying targets selected by pilots. RUAVIATION.com. Viewed 17 November 2019. <https://www.ruaviation.com/news/2019/2/21/12985/?h>.

⁹⁹ Haner, J. and Garcia, D., 2019. The Artificial Intelligence Arms Race: Trends and World Leaders in Autonomous Weapons Development. *Global Policy*, 10(3), pp.331-337. Viewed 22 November 2019. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/1758-5899.12713>.

¹⁰⁰ China, A.I., 2019. Development Report.(2018). China Institute for Science and Technology Policy at Tsinghua University. Page 46. Retrieved from: http://www.sppm.tsinghua.edu.cn/eWebEditor/UploadFile/China_AI_development_report_2018.Pdf.

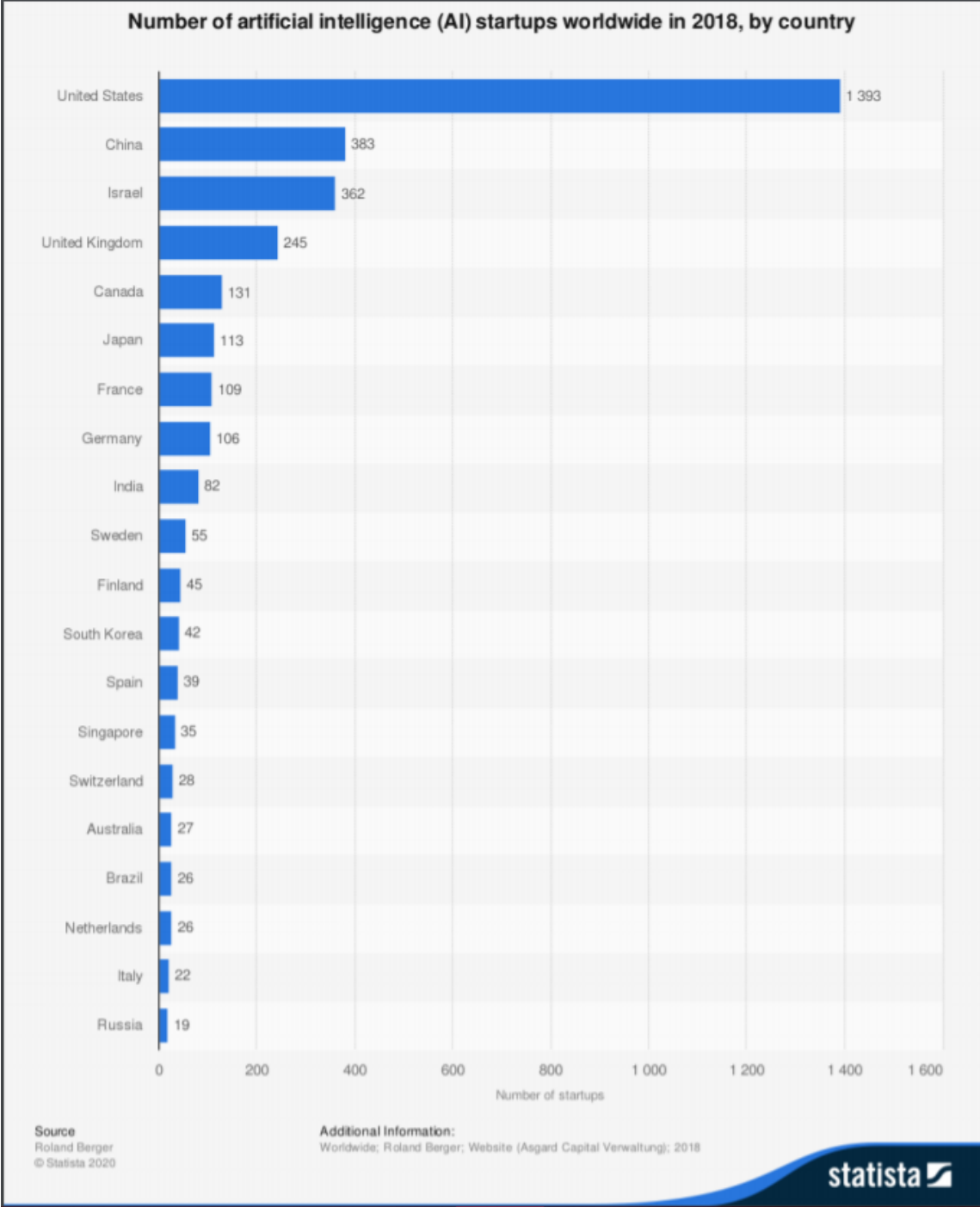


Figure 3: Number of Artificial Intelligence (AI) Startups Worldwide in 2018, by Country. See footnote 101.

¹⁰¹And, while Russia has devoted substantial efforts to coordinating between the government and academia, only one institution, the Russian Academy of Sciences, makes the list of the Top-20 Research Institutions in AI Paper Output, with no Russian universities making the equivalent list for non-research institutions.¹⁰² Part of this could be owed to the problem that not many people are “interested in LAWS...in Russia”¹⁰³ or that the Russian government simply “compete in the creation of autonomous armies with the United States and China.”¹⁰⁴ But, for whatever reason, Russia ultimately lacks the same resources and output capacity as its great power rivals, making the extent to which it possesses an explicit policy regarding LAWS difficult to quantify. What is notable, however, is that Russia is taking steps to ensure it engages with various sectors of society for a multitude of purposes, including military, civil, and research-focused. In that sense, the extent to which such a policy is present cannot be understated.

¹⁰¹ See Figure 3: Roland Berger. (May 15, 2018). Number of artificial intelligence (AI) startups worldwide in 2018, by country [Graph]. In Statista. Retrieved April 01, 2020, from <https://www-statista-com.ezproxy.library.tufts.edu/statistics/942657/global-ai-startups-by-country/>.

¹⁰² Ibid, 17.

¹⁰³ Vadim Kozyulin. 2019. Personal email correspondence. 25. November.

¹⁰⁴ Vadim Kozyulin. 2020. Personal email correspondence. 9. January.

DISCUSSION

Acting in Good Faith

The fact that Russia is making a concerted effort to direct resources at the national level for the development and application of LAWS is useful information in that it can guide other states and members of international organizations more clearly in how to respond and possibly cooperate on governance issues. However, the difficulty in this process remains in attempting to ascertain whether or not Russia seeks to develop its national projects and aim for national priorities in spite of international regulation efforts or simply because it views the regulation of LAWS to be a much smaller issue than the degree to which other states understand it. If Russia's efforts are taken in good faith, and the cause of Russia's actions within the GGE is to regulate LAWS to a much lower threshold than other states are pining for, then there are a few takeaways for the international community:

1. Russia will only support extremely limited regulation on LAWS;
2. Russia will not consider regulation of weapons which do not exist in functionality; and
3. Russia will only agree to regulate specific weapons through IHL.

Even when taken in good faith, these conclusions are not promising for the international community, the majority of which would like a more far-reaching regulation on LAWS, a broadly-based system of governance on emerging technologies that may not already exist, and the application of various aspects of international law, as opposed to IHL, for the governance of the two prior areas. The difficult position of this is that even if Russia's actions are to be taken in good faith, they severely limit the capacity of the international community, especially within the GGE, to arrive at a solution which is acceptable to all parties, if one is even available. This would most

likely push off any possible agreement over terminology and regulation for the foreseeable future, as the body is consensus-based, and Russia's arguments, particularly pertaining to weapons which do not yet exist, hold weight on the issue of "human-out-of-the-loop" systems. From these takeaways, however, the international community could recognize that Russia is in fact on board with various measures of governance, and that poses plenty of opportunities. Other states should come up with various types of agreements that allow for Russia to meet its governance goals while simultaneously building a platform of mutually-shared interests to grow from in the future. In any case, there is also no guarantee that an agreement with Russia would be easy to attain, but the possibility for cooperation remains, and the international community should do its best not to waste it, even if low in likelihood.

A Bad Actor?

The alternative, however, is that the Russian Federation is acting in bad faith and is purposefully stalling and delaying consensus within the GGE in order to gain as much time to organize national research, development, production, and application of LAWS. In this scenario, there are takeaways for the international community:

1. Russia will never agree to limit LAWS of any form, as they are a matter of national security and defense;
2. Russia will prevent the GGE from reaching a consensus on definitions of LAWS so long as that definition is perceived to impinge on national security regarding the permissible types of technologies to be produced and used; and,
3. Russia will never allow for any international forum to use apply regulations of international law other than limited IHL to autonomous systems of any kind, as it is up

to national policy to determine the role humans play in the operations of any autonomous systems.

This is undoubtedly a much more pessimistic understanding of the actions taken by the Russian Federation pertaining to LAWS' development and application. That said, it is difficult to separate Russia's actions within the GGE especially, as well as its cooperation with private companies and research institutions, from its national ambition to develop LAWS. What is particularly intriguing, though, about Russia's determination that each state should decide the extent to which humans operate with autonomous systems is that Russians are extremely wary of allowing a robot to make decisions which relate to health and safety of their lives, with over 70% of Russians surveyed saying that they would be uncomfortable with a robot taking care of grandparents, let alone deciding whether or not a robot should have the ability to take a life.¹⁰⁵

In any event on that front, the fact that Russia has repeatedly stymied progress on a number of issues, including attempting to undo language from previously agreed-upon documents, casts Russia's motives in far less than a good light. As such, it would be reasonable for the international community to disband the GGE and create a convention multilaterally at first that could then be adopted by more and more states. This solution, however, remains questionable in terms of approach, as it would be nearly impossible to persuade not only Russia, but the US, China, and other states which are developing AI and LAWS, to agree to such a limitation on national

¹⁰⁵ See Figure 4: Higher School of Economics. (September 4, 2019). Public perception of interaction with robots in Russia in 2018, by potential activity [Graph]. In *Statista*. Retrieved April 01, 2020, from <https://www-statista-com.ezproxy.library.tufts.edu/statistics/1059939/interaction-with-robots-perception-russia-by-type/>.

development for programs related to military efforts and national security. However, the international community could dismiss Russia, the US, and China, among other states, and come up with governance through a new forum that allows for the creation of customary international law surrounding the use of these weapon systems. In doing so, it would render the actions of Russia and other states less important, as consensus and common interests among a wide variety of states could push a governance mechanism over the edge and into force.

CONCLUSION

Overall, Russia possesses a national policy for the development and application of LAWS, and it is measurable through a variety of observations and definitely present, even if unofficially and without formal documentation. The ramifications this has on global governance remain slightly less clear. Although, regardless of whether Russia is acting in good faith or not through the GGE, the end result on governance mechanisms appears to be one which allows only narrow agreements and areas of compromise, especially considering the statements made by Russia's delegation. If the international community wishes to include Russia in the process of governance, it will need to cut back on restrictive terminology, weaken language surrounding the area of LAWS technologies, and specifically address individual systems, as opposed to creating broad regulation of areas of development and application, particularly those areas which hypothetically could be used in both civilian and military settings.

FIGURES

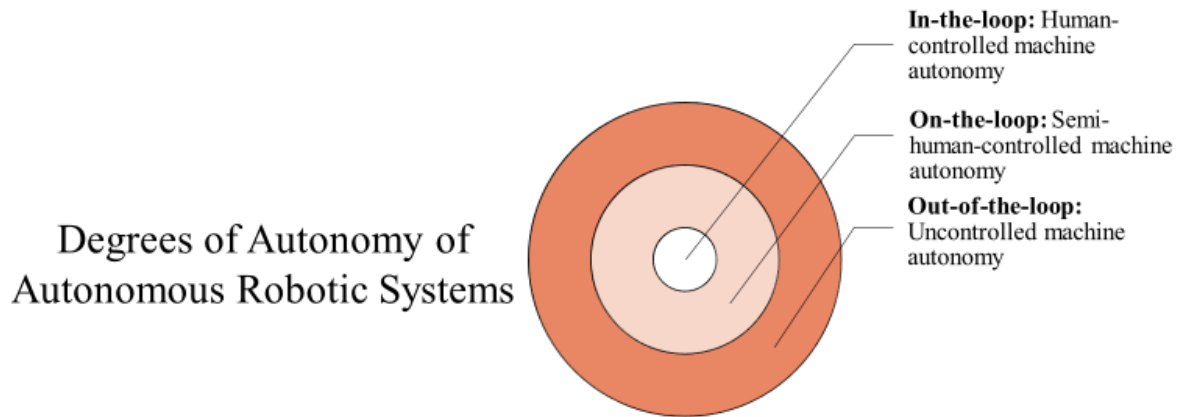


Figure 1: Degrees of Autonomy of ARS.

Non-Codified Classification of Autonomous Robotic Systems

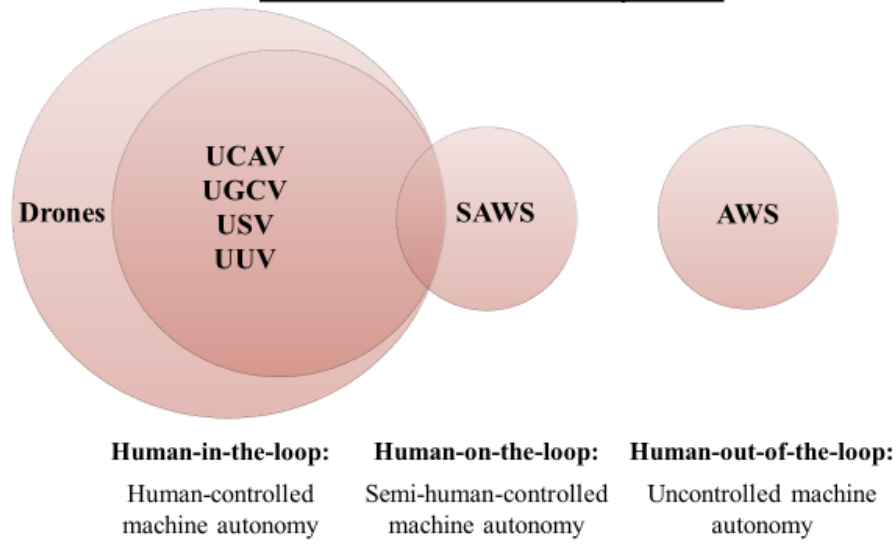


Figure 2: Non-Codified Classifications of Autonomous Robotic Systems.

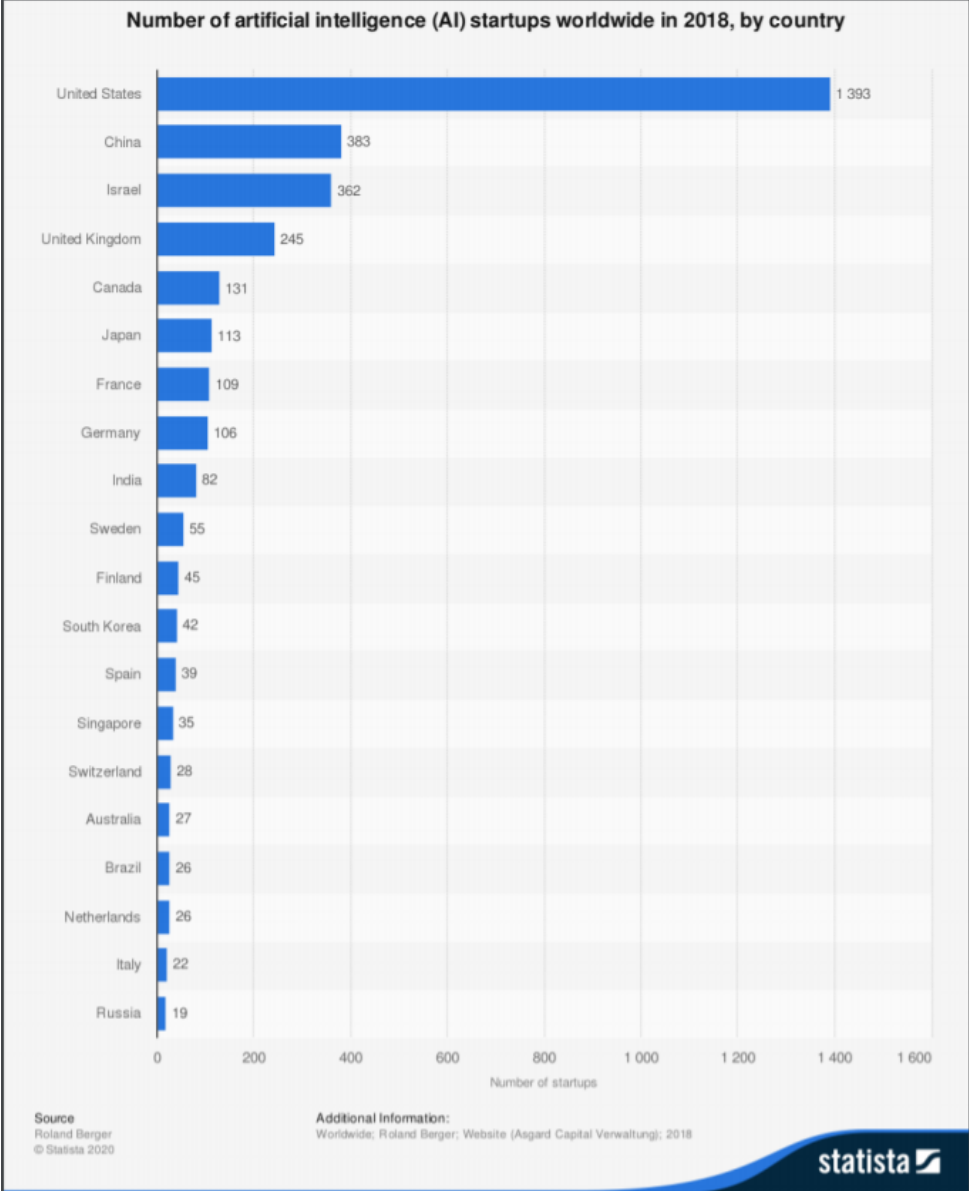


Figure 3: Number of Artificial Intelligence (AI) startups worldwide in 2018, by country.

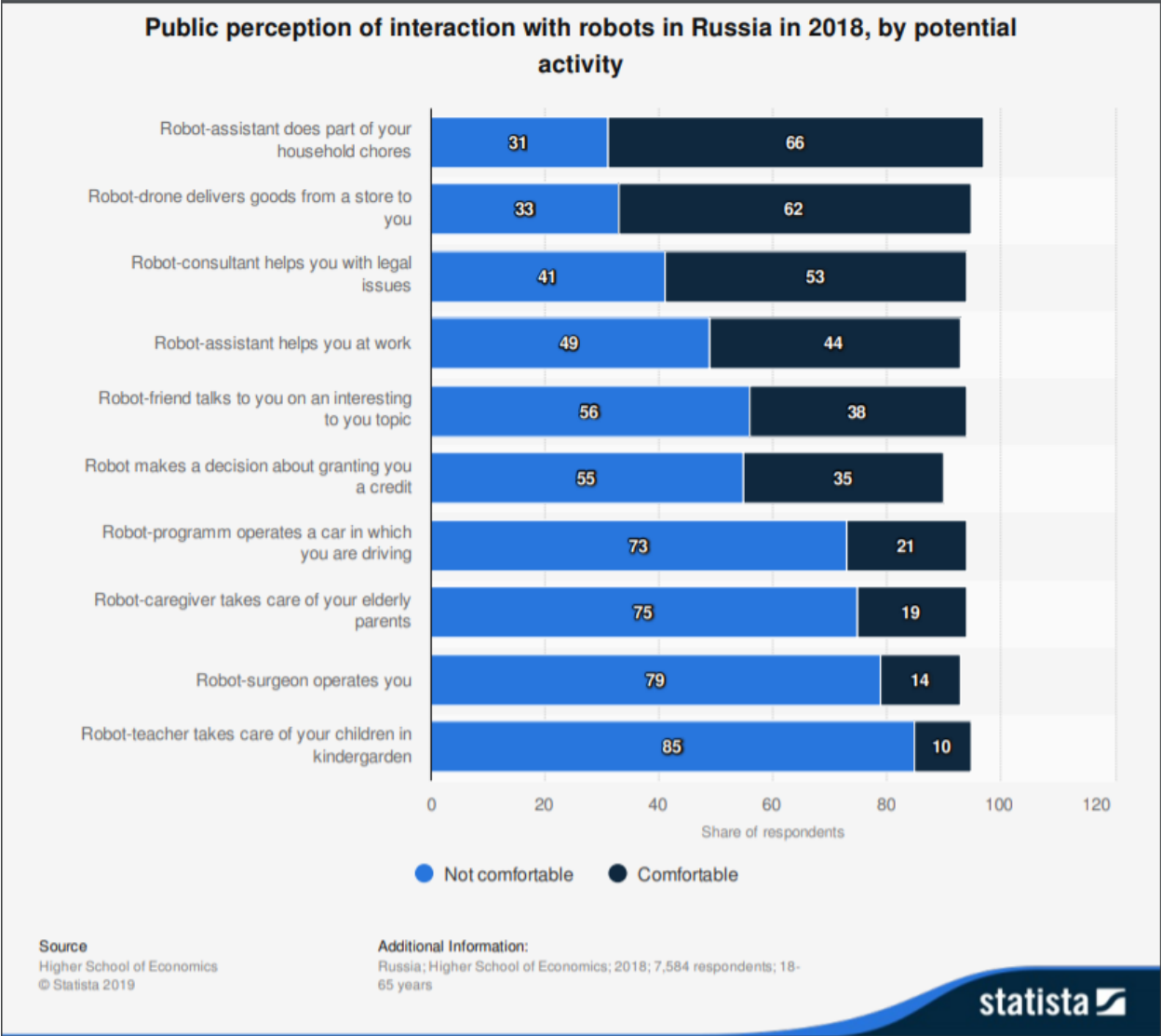


Figure 4: Public Perception of Interaction with robots in Russia in 2018, by potential activity.

TABLES

Acronyms
AAW - Automated and Automatic Weapons
AI - Artificial Intelligence
ARS - Autonomous Robotic Systems
AWS - Autonomous Weapon Systems
CCW - Convention on Certain Conventional Weapons
GGE - Group of Governmental Experts
HRW - Human Rights Watch
IHL - International Humanitarian Law
IHRL - International Human Rights Law
LAWS - Lethal Autonomous Weapon Systems
LOAC - Law of Armed Conflict
MALD - Miniature Air Launched Decoy
MALD-J - Miniature Air Launched Decoy - Jammer
SAWS - Semi-Autonomous Weapon Systems
UCAV - Unmanned Combat Aerial Vehicle
UGCV - Unmanned Ground Combat Vehicle
USV - Unmanned Surface Vehicle
UUV - Unmanned Underwater Vehicle

Table 1: Acronyms

Classifications of Autonomous Robotic Systems (ARS)	Definition (Implies Use of Lethal Force)	Includes
Human-in-the-loop	ARS can select targets and deliver force only with a human command.	Drones, UCAV, UGCV, USV, UUV, SAWS
Human-on-the-loop	ARS can select targets and deliver force under the oversight of a human operator who can override the robots' actions.	Drones, UCAV, UGCV, USV, UUV, SAWS
Human-out-of-the-loop	ARS that can select targets and deliver force without any human input or interaction.	AWS

Table 2: Classifications of ARS.

Type of Autonomous Robotic System (ARS)	“Loop” Classification(s)
Drone	Human-in-the-loop, Human-on-the-loop
UCAV: Unmanned Combat Aerial Vehicle	Human-in-the-loop, Human-on-the-loop
UGCV: Unmanned Ground Combat Vehicle	Human-in-the-loop, Human-on-the-loop
USV: Unmanned Surface Vehicle	Human-in-the-loop, Human-on-the-loop
UUV: Unmanned Underwater Vehicle	Human-in-the-loop, Human-on-the-loop
SAWS: Semi-Autonomous Weapon System	Human-in-the-loop, Human-on-the-loop
AWS: Autonomous Weapon System	Human-out-of-the-loop

Table 3: Types of Autonomous Robotic Systems and “Loop Classification(s).

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