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The Changing Nature of Warfare: Artificial Intelligence, Autonomous Weapons and Global Security

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Abstract

Although there have always been weapons that developed during the war, and there were those who fought with them, the use of artificial intelligence (AI) is something else. While previous technologies were used to further the reach, speed or destructive power of human soldiers, AI starts to take over aspects of the thinking that occurs before the use of force, such as sorting intelligence, recognizing targets, predicting enemy movement, and in the case of autonomous weapon systems, selecting and engaging targets with limited or no human intervention. The paper focuses on the changes these developments are bringing in the nature of armed conflict and their implications for global security. It takes a qualitative, document-based approach, analyzing the scholarly literature, think tank reports, legal and ethical opinions and official diplomatic documents primarily produced from 2012 to 2024 and then categorizes these documents based on five themes: speed, decision compression; changing role of the human; strategic stability and arms competition; legal and ethical accountability; and diffusion of military AI to weaker states and non-state actors. The analysis suggests that AI could be used more to change the nature of war than to make it more likely to happen, but that the change could have significant impacts on unintended escalation, accountability, and an all-out arms race. It calls for the notion of "meaningful human control" to be "converted into concrete and verifiable standards, and for confidence-building measures between the main powers to be a more realistic intermediate measure than a complete ban. It concludes with policy recommendations for states (including India) and further research.

Keywords: artificial intelligence, autonomous weapons, lethal autonomous weapon systems (laws), global security; future warfare, international humanitarian law, meaningful human control, strategic stability

Introduction

In 1830s, Prussian officer Carl von Clausewitz had said that war is a continuation of politics by other means" and that it's "like a chameleon, changing with the circumstances. These comparisons have withstood the test of time. All of these – gunpowder, railway, machine gun, aeroplane, nuclear weapons and satellites – changed the conception and the practice of wars but in not one instance did the logic of war change. Organized violence was always used by

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one political community to seek to impose its will on another. The question now on the table is: Is AI only a new chapter in the old book story or is it a book that breaks?

Now is the time when everyone is asking this question, as AI has left the laboratories. Armed forces all over the world use machine-learning systems for image analysis, logistics, cyber defence, surveillance and predictive maintenance. Loitering munitions, or drones that circle an area and strike a target that they identify, have shown up in Nagorno-Karabakh to Ukraine. A United Nations Panel of Experts (S/2021/229) on Libya produced a report in 2021 about a Turkish made, Kargu-2 system that is said to have been deployed to hunt retreating fighters without a continuous connection to an operator, a fact on which there has been a broad public debate, though the facts remain disputed. The data-driven targeting tools covered in recent wars just further confirmed that machine-made recommendations are in the real kill chains.

In two ways this is a development that is unusual. First, AI is like electricity, a general-purpose technology rather than a particular weapon and it can be applied to almost every military activity – and many of the components that make AI work, like data, algorithms, computing power and talent, are from the civilian economy. Secondly, after using AI the human judgement or force equation can be changed or be mor precise but there is problem that Can AI differentiate between the victim or criminal. So, this is totally a mechanical process to run a rifle which need human assistance for moral responsibility.

The following issues are related to these features. From a strategic point of view, a quicker decision cycle can lead to less diplomacy and greater risk of inadvertent escalation. The principle of distinction, proportionality and precaution will be clearly applicable to a human operator, but under IHL, it is not clear how to apply them to the machine and who will be held responsible should the machine make a mistake. Ethically, there are concerns as to whether it's human dignity to have an algorithm determine life and death. The major powers are politically not willing to accept the limits which would slow down their own programmes, and consider AI as a source of future advantage.

These concerns are picked up in this paper in an organized fashion. It first surveys the literature, then commences with the aims and the approach and then follows with the analysis of the material in five themes, and conclusions. In every instance efforts have been made to differentiate between the reality in the country and the expectation, since there is a tendency for general public discussion on this topic to confuse the two.

Review of Literature

The field of military AI is relatively new and growing fast, and may be divided into four fields.

Technological and operational accounts are kept. The first research was on the definition of the autonomy of weapon systems. In their article for the Stockholm International Peace Research Institute, Boulanin and Verbruggen (2017) mapped systems that are autonomous at some level within their critical functions – such as air-defence systems and some loitering munitions – and demonstrated that such autonomy is not an on-off switch. Scharre's (2018) detailed history of automation in warfare and the salient question is whether humans are still part of the targeting cycle. As Cummings (2017) noted, however, humans are limited in what their machines can

perceive, and in what their machines can do in uncertainty, and that's where over-reliance is problematic, particularly in the fog of war.

Strategic and security studies. There is another group of scholars who aren't so certain about the changing dynamics and potential conflicts because of AI. Horowitz (2018) maintained that the impact of AI on international competition will not be so much about the technology itself, but about how fast the AI can be implemented and how fast the states can organize around it. Allen and Chan (2017) talked about the national security implications and highlighted the two-sided nature of the field. Altmann and Sauer (2017) made a strong case for why autonomous weapons would make strategic stability more difficult to sustain, because of a threatened proliferation of arms, a reduction in threshold for resorting to force, and unpredictable interactions between competing autonomous weapons. This mindset was extended to nuclear command and control, where decisions can be made much more rapidly with AI assistance may lead to more timely human decision making in a crisis (Johnson 2019). Kania (2017) explored the Chinese notion of "intelligentised" warfare and suggested illustrations of rethinking strategic concepts in the context of the technology.

Attorney-client privilege and other legal and ethical issues. A third body of work poses the question: Is the law enough? While not necessarily unlawful, autonomous weapons have been proposed by Schmitt and Thurnher (2013) to be legal if a certain system can be used in compliance with IHL. Critics disagree. Sharkey (2012) asked whether proportionality or combatant/civilian distinction can be algorithmically determined effectively and Asaro (2012) questioned the human dignity and the moral underpinnings of the law of war in delegating lethal decisions to machines. Human Rights Watch and Harvard's International Human Rights Clinic (Docherty, 2012) have called for a pre-emptive ban and the ICRC (2019) have highlighted the human-centredness of war and the need for human judgement in life and death decisions.

Diplomatic and Policy documents. Lastly, there is a large body of primary material that documents state responses. In 2019, the Convention on Certain Conventional Weapons (CCW) in Geneva, resulted in the adoption of a set of eleven guiding principles, which includes a commitment to the application of IHL to all weapon systems and to the fact that human responsibility cannot be delegated to machines. The United States has policy on weapon system autonomy, that was issued in 2012 and again in 2023, DoD Directive 3000.09. In 2023, the United States also issued a Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy and the United Nations General Assembly adopted its first-ever resolution on lethal autonomous weapon systems (Resolution 78/241) in December.

Lack of research. A lot of what is written is about the strategic issues, legal and ethical issues separately and a huge proportion of which is from western institutions. There is relatively scant literature that integrates these aspects into one model, or that takes into account the perspective of middle powers and/or developing countries that live with the impacts and do not develop the technology. This paper seeks to contribute a connected reading of the debates with emphasis on these more numerous states.

Objective of the Study

The goals of this research are to:

- To delve into the character of contemporary warfare in an age of AI and autonomy.
- To discuss the effect of AI systems and autonomous weapons on strategic stability and global security.
- To examine the legal and ethical issues these systems pose in particular in terms of international humanitarian law and accountability.
- To assess the existing global governance initiatives and to propose policy options.

The main research question is: *How does military AI change the nature (not just character) of war and what can be done to manage the risks it poses to global security?*

Research Methodology

This research is a kind of qualitative research in descriptive-analytical approach and 100% secondary data. A primary survey and fieldwork was not carried out in part because of the classification of operational information on military AI and the unreliability of such information, as well as because of the conceptual and policy nature of the questions asked in this study.

Sources. The sources used to draw the material included the following categories: peer-reviewed journal articles and books, research institution reports (e.g. SIPRI and Belfer Center), legal commentary and publications by humanitarian organisations (e.g. ICRC), and official documents (including United Nations records, CCW working papers and national policy documents). The sources were mainly from 2012 and onwards, when the discussion of autonomous weapons came to the fore, but earlier theoretical work has been utilized for background.

Selection criteria. A source was included if it had a focus on military uses of AI or autonomy and was authored by a recognisable publication or author (scholarly or institutional) and also included an argument or evidence other than the description of the news. The use of media reports was restricted and cautious only to illustrate developments as many claims of battlefield use are not independently verifiable.

Analytical approach. Diffuse data were carefully read and coded using a thematic analysis. The arguments that were repeated were identified and classified into themes and then into five main themes. Each theme had competing positions which were compared, and the strength of the underlying evidence was weighed. Through the same process the study was able to differentiate between what is known and what is only plausible as well as what is normatively desirable.

Limitations. These programmes, of course, are by definition not fully visible if they rely on secondary and open sources. Conclusions may need to be revised due to the technology constantly evolving. Last not least the subject matter is unusually value-laden; and where it has taken a one-sided turn, the author has tried to give the other side a fair representation.

Data Analysis

Five key themes emerged from the thematic reading of the literature, and are summarised in the table below and discussed in turn.

Theme	Core claim in the literature	Main concern	Illustrative sources
Speed and decision compression	AI shortens the observe-decide-act cycle	Escalation with little time for judgement	Johnson (2019); Cummings (2017)
Changing role of the human	Humans move from deciding to supervising	Automation bias, loss of real control	Scharre (2018); ICRC (2019)
Strategic stability and arms competition	AI is treated as a decisive advantage	Arms races, mistrust, unstable interactions	Altmann and Sauer (2017); Horowitz (2018)
Law, ethics and accountability	IHL applies, but its application to machines is unclear	Responsibility gaps, human dignity	Sharkey (2012); Asaro (2012); Schmitt and Thurnher (2013)
Diffusion and proliferation	Cheap, dual-use technology spreads widely	Use by weaker states and non-state actors	Allen and Chan (2017); Boulanin and Verbruggen (2017)

Theme 1: Compression of Time and Decisions.

The most frequently changed is the change of speed. Machine-learning systems can quickly sift through satellite data, incoming signals and sensor data, and recommend or initiate responses, faster than any human analyst. In the military world this is the breakdown of the decision cycle, which has always been described as observe, orient, decide and act. It's easy to see the benefit to the player with the quicker hands. The danger is also clear: leaders may not have as much time to ask themselves questions, to check the information to see if there's any mistake, or to talk to the other side when it's a tense situation. There is an analogy in the financial world – automatic trading systems have resulted in unpredictable financial crisis. There is concern that such a ‘flash' could be a problem on which automated systems could respond faster than human response (Johnson, 2019). The worry is particularly significant when AI works alongside systems designed to issue early warnings or systems that control nuclear commands, where a false alarm could be acted on too quickly, with devastating results.

While that speed is by no means fast, it's not terrible either. Better and faster analysis can in principle decrease mistakes, such as misidentifying civilian objects, or it can help to keep commanders from making hasty decisions in a crisis situation. As a result, the literature not only depicts speed but also man's ability to keep up with it or not.

Theme 2: The Role of the Human Person in the World is Changing.

The second theme is related to the role of man towards the machine. The terms "in the loop" (where a person must approve each use of force), "on the loop" (where a person is present to supervise the system and can intervene) and "out of the loop" (where a system is acting alone once activated) are commonly used when describing such systems. Cleanliness analysis of categories. A human can be forced to accept hundreds of machine recommendations in a short period of time and superficially approve them. This is called automation bias and is the tendency to believe that the output of a system is the consequence of an objective and fast operation. But if not, then it is only in theory and not in practice.

So much so that the term ‘meaningful human control’ found in the States and also used by the ICRC has garnered so much attention. It's supporters claim that it's more important to be involved than not, but more important to be involved well. The problem is there's no universal meaning for the phrase. Does it require manning to select the targets or is it just used to “program the mission parameters?” What information should the operator be able to access and how long should it take? In the absence of such answers, the term can be converted into a slogan that can be embraced by all the States and interpreted in various ways.

Theme 3: Strategic Stability – Arms Competition

The third theme is Strategic setting. The use of the "competition" language in the policy documents of the major powers is evident, and AI will certainly be a major component of military and economic strength in the future. In this sort of environment a classic security dilemma arises in which actions by one state to increase its own security, like the development of faster, more independent means, trigger security fears in other states and drive them to take counter measures. As Altmann and Sauer (2017) point out, transparency and predictability of military AI is limited, which further compounds the problem. A state can't necessarily see how another country's algorithm will react and it also can't guarantee its own will react as it is supposed to when it confronts another country's system in a real crisis. This uncertainty will make for worst case planning.

Others do not have quite such a positive view of the arms-race scenario. Yet perhaps AI's impact on the balance of power will be a slower and more uneven transition, for the technology must be organized, trained and trusted by the armed forces in order to be proven, as Horowitz (2018) has mentioned. Both the tank and the airplane were slow to change their doctrine, and history shows that 3-D printers will follow suit. However, although the reality of a race is important, a first impression can compel a driver to do something as much as the reality does, and leaders act on their first impression of what their opponents are doing.

Theme 4: Law, Ethics and Accountability

From a legal perspective, most states and experts deem that the IHL applies to autonomous weapons. They are concepts of distinction (separation of combatants and civilians), proportionality (civilian harm is not disproportionate to the military advantage) and precaution (reasonable precautions are taken to minimize harm). The dispute is about whether or not machines can conform. Those who are sceptical of autonomy speak of the distinction and

proportionality as appeals that question the algorithmic ability to make contextual and moral judgements. More receptive ones reply that the law is to regulate the use of a weapon; that a system could be limited to very few use cases and be predictable to comply with the law; and that even human soldiers don't comply often (Schmitt and Thurnher, 2013).

This issue of responsibility is more problematic. In theory, an independent system would be able to accidentally kill civilians, and the responsibility fall on the programmer, commander that deployed it, manufacturer or state, but in practice, no one can be held responsible. However, the actions of the machine are likely not those the commanders would expect and the developers are miles away from the battle field. This is referred to as responsibility gap. It's not only the legal aspect of it; Asaro (2012) and others argue that to be killed by a machine decision and not by a human being who can see the victim as the human being he is is a violation of human dignity, regardless of the accuracy of the machine's decision. Those who disagree with this argument say it is the result that matters and a better system will save lives. The analysis reveals that both sides are rational, and that this conflict is not simply epistemological in nature, but also contains a moral aspect, and that this conflict cannot be solved by evidence.

Theme 5 - Diffusion and Proliferation

The last theme is that of the diffusion of the technology. Unlike nuclear weapons, which need special materials and facilities, military AI can be created with more readily-available materials and in smaller facilities. Commercial drones have already been modified to carry weapons by states and armed groups, and so have have been cheap loitering weapons. Prices are coming down and less capable states and non-state actors can now acquire capabilities that were previously the purview of more capable militaries, with a commensurate change in the nature of asymmetric conflicts. It also renders regulation more challenging, because there are significant civilian applications, which makes it more difficult to control than if it were purely for war (Allen and Chan, 2017; Boulanin and Verbruggen, 2017).

Another impact is on the sense of war. If a war occurs, one side may seem to be more economical than the other if they have the machines on their side as they would lessen the risk of their own soldiers being used in the battle. Some analysts are concerned that this will make political opposition to intervention less likely, and that it will pave the way for intervention to begin. Others contend the technologies can lead to a more attritional war, like the one being fought in Ukraine, which has thus far been fought by both sides by swarming cheap, abundant drones with no apparent effect on the outcome of the war. Evidence is therefore mixed and care needs to be taken in making generalisations.

Conclusion

This paper aimed to gain an insight into the impact of AI and autonomous weapons on warfare and its implications for global security. Its key findings for the main results are summarized below.

First, the nature of warfare is being transformed by AI, making decision making easier, faster and giving some degree of autonomy to the conduct of warfare. But there are yet no clear signs

that it has changed the essence of war. There still is friction, uncertainty and political purpose, and friction from the technology per se.

Second, the threat is the mixture of the speed and automation bias, together with strategic competition. Wherever man is formally in control, but is de facto in a "no man's land" situation, and wherever his rivals think that they are losing out, the chances of an accidental escalation and an uncontrolled arms race is greater.

Third, the existing legislation is incomplete and without it, there can be no governance. There IHL is indeed applicable but to what extent the compliance and questions of accountability can be answered with general declarations.

Fourth, Dual use technology is ubiquitous, and cannot be controlled by the consent of a few major powers. Weaker states and non-state actors will be impacted and may become users.

The following suggestions are made from the above findings.

- Specify human control. The term ‘meaningful human control' should be replaced with clear conditions, at least the volume of information, time and authority required of the operator to maintain control, and where the autonomy of the decision to target is deemed unacceptable.
- Focus on confidence building first, then a treaty. Information sharing, in testing and evaluation, and measures for crisis communications, and the “human thread” in nuclear command and control, are some of the other “somewhat feasible” measures that could be more achievable in an era when even some of the key powers are not ready to sign on to a comprehensive ban.
- Make more rigorous testing, assessment and transparency. Systems should be tested prior to deploying to test for reliability, and states should be prepared to give information about the system review process, without showing technical information, even though systems are bias or resistant to deception.
- Clarify accountability. National legislation should be available for who is responsible for the use of the autonomous systems and record keeping for review of actions.
- Widen participation. There is a stake on the rules by the developing countries of which India is one. India has a vast defence setup and is a strong champion of defence restraint in international bodies and can therefore promote balanced norms that would recognise the need for defence, but also the human responsibility.

The study has some drawbacks. Uses open sources and will not be able to represent classified developments; and because the field is so new, some of the observations may be outdated. Future research should include specific case studies for certain regions, continue to compare the national doctrines, and study how soldiers interact with the AI decision-support tools, and what the effectiveness of various verification methods would be. More will be accomplished in the next few years until the norm is set, than by any one technical accomplishment.

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