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AI and Modern Warfare

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Abstract

This review explores the advancements of autonomous systems in warfare, focusing on the ethical and moral concerns surrounding the integration of AI in autonomous weapons systems and surveillance. It addresses common questions about privacy exploitation, the moral dilemmas of machine learning models, and the ability of AI to perform ethically in critical situations. Additionally, the review examines the issue of accountability in cases of unintended harm caused by miscalculations in AI-powered military systems. The main sections of the review focus on ethical concerns in autonomous weapons, AI-enabled surveillance, the potential for AI to escalate conflict and cause military miscalculations, and national and international regulatory initiatives. Ultimately, the review aims to understand the current scenario of AI in military contexts, assess the timeline for AI's increasing role in warfare, and highlight the importance of human-centric design in future AI advancements.

Table of Contents

Abstract.....	1
Table of Contents	2
1. Introduction.....	3
2. Review: AI and Modern Warfare	4
2.1 Ethical Concerns in Autonomous Weapons Systems	4
2.2 AI-Enabled Surveillance and Intelligence Gathering.....	5
2.3 The potential for AI to Escalate Conflict and Military Miscalculations.....	6
2.4 National and International Initiatives.....	7
3. Conclusion	7
4. References	8

1. Introduction

Conflicts and warfare are unavoidable aspects of human society. Experts criticize this viewpoint of war as being inevitable. (LOWENHARD) believes that biologically, the hunger for power drives people to create themselves a security zone to protect their integrity. War seems to be a human choice influenced by social, political, and economic factors. In the history of warfare, massively powerful weapons were created by humans to serve the ambitions of those seeking dominance, resolution, or rule. The potential for even more devastating and unimaginable creations lies within us.

Technology is the main enabler of such innovations. Today, Artificial intelligence stands as the next milestone in this evolution, because of both human ingenuity and machine intelligence. The machine can be considered autonomous only when it has ⁵ knowledge about the world, logical reasoning and skills to learn and adapt writes (Bartneck et al., 2020). The author then declares that “what is considered “autonomous” in a vehicle is different to what is considered “autonomous” in a weapon.” AI has largely been integrated into autonomous weapons systems and surveillance blurring the line between human decision-making and machine autonomy, which raises interesting questions about accountability, AI ethics, and the nature of conflict itself.

Can machines be trusted to make life-and-death decisions? Who is accountable for unintended harm caused by AI systems? Is 100% accuracy possible? Should we accept some level of inaccuracy in AI systems for the sake of their benefits in warfare? Is any level of inaccuracy acceptable in such critical applications? Should AI in warfare always require human oversight, or can it act autonomously in certain situations? What is the psychological impact on soldiers or operators who control or interact with AI systems capable of killing? These are some of the common concerns about integrating AI systems in warfare.

2. Review: AI and Modern Warfare

This review is focused on exploring ethical concerns in autonomous weapons systems, as discussed earlier. Likewise, how far can AI-enabled surveillance and intelligence gathering go, raising the questions about privacy as a right and security as a need? Can AI predict enemy behavior, and can we trust them? We will also explore the potential for AI to worsen the conflict and cause military miscalculations, for which the respective parties might have to bear significant losses. If such ethical dilemmas exist, solutions and mitigations will surely come into play, hopefully leading to better AI systems or a more effective way of handling wars and conflicts. This review will also explore such solutions and mitigations. We will also discover whether any initiatives from national and international parties have been undertaken so far, along with their future plans.

2.1 Ethical Concerns in Autonomous Weapons Systems

It is our moral right to question whether something is ethically right or wrong. In situations involving serious implications like the use of Autonomous Weapons Systems, there is no doubt that numerous ethical concerns can be raised and voiced, naturally sparking debates and discussions. Practical importance or urgency gives rise to such questions; questions that emerge in moments of uncertainty about what should be done and how existing principles apply in concrete situations (Ward, 2018).

Mr. Jeffrey L. Caton, in his paper, introduces definitions of increasing levels of autonomy: Semi-autonomous, Human-supervised, and Fully Autonomous systems, which he refers to as "Human in the loop," "Human on the loop," and "Human out of the loop," respectively. If unlawful killings or other harms are caused by weapons or robots programmed to kill, someone should be held legally and morally accountable (Caton, 2015). He further highlights that the lack of clarity

in accountability and the failure to address this issue could lead to bans¹ on the development, production, and use of autonomous weapons.

As defined by the¹ United States Department of Defense, weapons with the⁷ ability to select and engage targets without any human control or intervention, once activated, can be²¹ referred to as Autonomous Weapons Systems (AWS) (BRUUN, 2021). They possess the capability to make their own decisions, identify targets, and act upon them without direct human input, which sounds alarming. This raises ethical risks associated with removing humans from decision-making in life-and-death situations.

As mentioned earlier, a fully autonomous system can target its enemy on its own. However, many argue that in warfare, sensors may never be able to reliably distinguish between civilians and combatants (Andersson, n.d.). A mistake of this nature could cost the lives of innocent people—individuals with families to feed, countries to contribute to, taxes to pay, and responsibilities and interests that are all erased by an autonomous machine. Furthermore, the paper highlights an important debate regarding who should bear the blame: the commander, the programmer, the manufacturer, or even the machine itself.

2.2 AI-Enabled Surveillance and Intelligence Gathering

Crimes are increasingly being investigated and committed at an alarming rate. In response, AI-enabled surveillance systems are making robust changes in terms of public safety, national security, and overall protection. These systems are designed to detect unusual behavior in individuals. For example, facial recognition surveillance can identify such activities, gather information, and decide whether to associate the person with an offense. Therefore, they are considered potentially useful tools in addressing societal crises (Fontes et al., 2022).

How the system recognizes unusual activities depends on the data it is fed and trained on, as well as the training process and those responsible for it. Such systems heavily rely on data, as data dependency is an inherent feature of AI (Fontes et al., 2022). If we focus on data, the question arises: what kind of data is being used? If these surveillance systems are closely tied to detecting and fetching personal data, isn't this a concern for the privacy of individuals who simply want to live their lives without their data being stored on virtual machines? Furthermore, the article emphasizes that FRT (Facial Recognition Technology) help reduce crime by identifying known or suspected criminals, terrorists or someone who is missing, which is a good indication that such AI powered systems are benefitting the system. However, there are so many practical implications where data has been exploited for profits and mass surveillance purposes. For instance, AI technology has been exploited by some autocratic governments such as China, Russia and Saudi Arabia (Feldstein, 2019) to obtain certain political objectives.

2.3 The potential for AI to Escalate Conflict and Military Miscalculations

Machine learning, a subset of AI, involves processes to train large amounts of data, process it, and train the system to make decisions. However, there is a debate that AI is fed with code and data that is not neutral, i.e., because of the existing racial and cultural biases of the community that created the datasets (Bellaby, 2021). In the case of a moral dilemma, the system can fail to do or not do certain action. There is a huge risk with ML systems, as there can be unintended flaws in the training process. The data used to train the model can change during deployment due to environmental factors (Heeu & Kim, 2023). Furthermore, the authors highlight that such shifts in change can result in a decrease in the accuracy of the model's predictions, eventually leading to military miscalculations and escalating conflict.

2.4 National and International Initiatives

Various national and international efforts are being made to address the ethical and legal challenges of AI in warfare. Undeniably, to protect civilians, various frameworks and laws will be implemented or launched, including the Laws of Armed Conflict (LOAC), International Humanitarian Law (IHL), and other international regulations. IHL is governed by the Geneva Conventions and their additional protocols. Similarly, the Martens Clause serves as a moral guide in cases involving emerging technologies like AI in warfare (Irakli Chalagashvili, 2024). Furthermore, this paper introduces proposals for new regulations, such as new international treaties, updates to existing treaties, global cooperation, and dialogue. The United Nations Group of Governmental Experts (GGE) on Lethal Autonomous Weapons Systems has been particularly effective in advancing discussions around new regulations.

3. Conclusion

War, conflicts, and disputes will continue to happen, and technological advancements will skyrocket. There may even be greater evolutions than autonomous systems in warfare. The military world operates based on a system and guidelines. The rules and regulations should be clear and objective before future events occur. Regulatory bodies and military leaders should create policies that are free of risks. The risks associated with AI, especially autonomous systems, are significant and should be minimized.

Rather than having humans "out" of the loop, they should be part of the decision-making process and overall activities in the war zone. Although fully automated soldiers without human intervention might seem possible, it is still hard to imagine them existing in the future. Accountability and transparency must be addressed in cases of unintended harm. The development

of such systems should be performed with a focus on ensuring that AI actions comply with ethical and moral standards.

However, their existence cannot be underestimated. They are powerful and will continue to be so in the future. Therefore, a proper balance of ethics, accountability, and policies must be integrated.

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