The Ethics of Autonomous Weapon Systems

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

With my own personal interests and aspirations in the United States Military, I wanted to address the idea of Autonomous Weapon Systems (AWS), military weapons that utilize artificial intelligence to make decisions and deploy actions without direct human control or intervention. The capabilities of AWS to independently select and engage targets can lead to people viewing these systems as corrupt or unregulated as they may take actions that look like war crimes, like the destruction of a village or the downing of a passenger jet (Crootof, 2016). I wanted to discover the ways in which these systems are regulated and utilized to make military operations more efficient and safer for civilians and military personnel.

As the development and deployment of autonomous weapon systems (AWS) continue, ethical concerns surrounding their operations become more evident. Additionally, questions remain on how to ensure that the operations of these systems stay within the bounds of the Law of Armed Conflict (LOAC). Even when not fully autonomous, the use of drones in warfare presents challenges in pinpointing individual criminal responsibility due to unclear legislation on placing blame in situations involving LOAC violations with human-operated drones. Although drones may offer efficiency and success on paper for some situations, there are concerns about the rapid communication and follow-through during the planning stage of a mission. Sudden changes can occur that lead to unintended civilian casualties and war crimes. Therefore, the ethical implications of using drones in warfare must be studied carefully. One possible approach is to ensure that human supervision is always required for the final determination of whether a target is lawful, in accordance with Article 57 of the International Humanitarian Law (IHL) on Precautions in Attack (1977) (Nucci, 2016). This would help address concerns about

transparency, accountability, and respect for human rights in the use of autonomous weapon systems.

While the use of these systems is accompanied by detrimental risks and consequences, there are methods and approaches to the use of autonomous weapon systems that continue to be updated by government agencies, such as the Department of Defense, and utilized by the United States Military. Understanding the social construct surrounding AWS brings about a key factor in the ethical decisions surrounding the development and deployment of these systems, specifically analyzing them through the military-industrial complex. The data available on autonomous weapon systems and its ethical concerns displays many concerns in relation to the cost efficiency of these systems, as well as the steps that must be taken when developing and operating them to mitigate the risk of unnecessary harm. Through these findings I analyzed the ethical concerns of AWS and how directives of the United States government are put in place to specify the concerns for accountability (LOAC) in their use, as it is harder to interpret for autonomous warfare than human warfare.

Through my research and findings, I can conclude that there are many ethical implications that accompany the use of AWS by the United States military, with government entities taking steps to regulate their use and clarify these implications, the guidelines being set are decreasing the ambiguity of these factors and finding ways for these systems to be both safe and effective in their use. In examining upsides to using these systems, the entities of the United States government continue to produce regulations and directives that keep the use of these systems clearly aligned with the LOAC. Through these advancements, the LOAC becomes more applicable to autonomous weaponry, pinpointing accountability and regulating development.

Literature Review

Previous research has found concerns about several factors surrounding the use of autonomous weapon systems. One factor is the concern for transparency and accountability when using these systems, which connects to the need for government regulation around them to ensure proper measures are taken when commanders are operating them. With respect to the designers and possibility of human control, Roff explains that there would be an accountability gap between the military operators or commanders and the AWS, leaving a possibility for no person to be held accountable in a way that is adequate to the possible outcomes (Roff and Moyes, 2016). A main concern surrounding autonomous weapon systems is the potential for unintended consequences, including accidental harm to civilians or friendly forces, misidentification of targets, or cyber vulnerabilities. It can be difficult to understand how these systems make decisions and how to hold individuals or organizations accountable for any harm caused. Research has also found that the use of AWS could potentially increase the frequency and severity of armed conflict, leading to greater loss of life and destruction, along with the dehumanization of warfare, which would also make it easier to engage in violence and conflict. In circumstances where autonomous systems are deployed during periods of heightened tension to patrol conflict areas without risking human life, their autonomous target selection and ability to defend in the event of jammed communications could result in unintended escalation if they engage with illegitimate targets (Scharre, 2016). This increase in frequency can also be linked to the cost efficiency of these systems, encouraging the use of these systems. These systems are more cost efficient than traditional military operations, which require extensive training for human personnel, including recruitment, training, salaries, benefits, and pensions. Autonomous weapon systems are accompanied by the cost of the initial production, along with the pay of

personnel, maintenance, and oversight, which undercut the cost of traditional military operations, along with cutting out the costly training timeline needed for human personnel (Brock, 2017).

I chose Actor-Network Theory (ANT) to analyze the ethics of autonomous weapon systems because it emphasizes the agency of non-human entities in shaping social interactions and outcomes. ANT can be used to trace the relationships between the various actors involved, including the military, engineers, policymakers, and technology itself. This can help reveal how the deployment of autonomous weapon systems is shaped by both human and non-human factors. According to Walsham (1997), "Actor-network theory examines the motivations and actions of groups of actors who form elements, linked by associations, of heterogeneous networks of aligned interests. A key feature of the theory is that actors are taken to include both human beings and nonhuman actors such as technological artefacts" (p. 468). Using this concept when analyzing the ethics of autonomous weapon systems using ANT can reveal the influence of factors such as technological capabilities, military strategy, and political pressures. It can also reveal how the deployment of these systems is shaped by the relationships between the various actors involved, such as the military's relationship with the technology manufacturers, and the political context in which these decisions are made.

To further my reasoning for choosing ANT framework, it aids in the analysis of the public and relevant social groups affected by the military's use of AWS. It emphasizes that the use of technologies, like AWS, is shaped by the values, interests, and power dynamics of the society in which they are developed and deployed. ANT categorizes the public and the institutions involved in the development and deployment of such systems as interconnected actors in a network, allowing for analysis of the broader social and political contexts that shape the use of AWS. This includes analyzing the role of the military-industrial complex, the

influence of political and economic interests, and the cultural beliefs and values that shape public perceptions of autonomous weapons. The interconnected actors in this network can be grouped into two categories: affected public, which includes civilians in conflict zones, activists and grassroots movements against AWS, and non-government organizations advocating for human rights and international humanitarian law; and institutions using AWS, including military personnel deploying and operating AWS, defense contractors, the United States government, and its respective defense departments. ANT analysis in this context assists in discussing the ways autonomous weapon systems are framed and understood in public discourse, as well as the social and ethical implications of their deployment. This framework could explore how the development and use of autonomous weapon systems are justified by different actors in a network, and how these justifications shape public debates around the ethics of such systems. It also can be used to explore the ways in which autonomous weapon systems might reinforce or challenge existing power relations and social norms, and the ethical implications of these changes (Surabhi, 2019).

Methods

I gathered my sources by first analyzing the STS framework I chose and found trusted sources that incorporate the factors of ANT that I sought to address in my analysis of AWS. Through finding sources addressing the ethical implications of AWS in relation to ANT, I found the factors I could incorporate into my research and searched for sources that engaged in the concerns of these factors.

With the LOAC being a large part of the ethics of AWS, I searched for documents that related to the LOAC and the involvement it has in the development and deployment of AWS. In

searching for documents that address these government policies, I found directives developed by the Department of Defense (DoD) that aligned with advancements in technology and the use of autonomous weapon systems. When finding these updates of the DOD directives, I mapped out when these directives were published against the timeline of advancements in technology that are used in autonomous weapon systems.

Analysis

The ethics of autonomous weapon systems have been a topic of considerable debate, particularly within the framework of Actor-Network Theory (ANT), which provides a nuanced approach to the relationship between nature, culture, and technology. According to Latour, ANT frames these relationships as a dynamic network that is constantly shifting, highlighting the importance of examining the complex relationships between human and non-human actors involved in the development and deployment of these technologies (Latour, 2007). In this context, the delegation of fault and responsibility is a critical element that must be considered when analyzing the ethical implications of autonomous weapon systems.

In the case of AWS, the network is the connection between the technology and its several actors, including the commanding officer giving order, the direct controller of the device, and the engineers that programmed the device (people on the ground), while the drone itself can be analyzed as an "actant" capable of carrying out the practices established by the network. The role of each of these actors are entangled with different responsibilities that affect each other and enable the actions of the AWS, the pilot taking over and giving direction to the system when necessary, the commanding officer making the decisions for the pilot, and the engineers pre-programming the device to enact on certain targets based on its environment. In connection to

these roles, Tognocchi's thesis highlights this perspective, noting that "drones can be analyzed as 'actants' or mediators in the spatial 'network' where pilots and the people on the ground are inscribed together. Drones are capable of circulating practices from long distances and across diverse scales, intimately connecting operators to the people on the ground in real-time" (Tognocchi, 2018, p. 37). When examining the ethical dilemma that accompanies autonomous weapon systems, viewing the pilots of the system and the people on the ground as a network inscribed together, and the AWS as an ‘actant’ in the spatial network allows for the ethical decisions and actions in the network to be analyzed more efficiently (in accordance with LOAC).

Another important actor in the development of autonomous weapon systems is the technology itself, which has its own agency and can shape the behavior of human actors. Autonomous weapons can be seen as "moral mediators" that play a role in shaping the moral decisions of human operators and commanders (Asaro, 2016). This brings about questions regarding the ethical implications of ceding decision-making power to AWS, as well as the extent to which operators of the systems can be held accountable for unlawful actions. Also, the actors inscribed together on the ground can shape the development of autonomous weapon systems through decisions about funding, regulation, and deployment.

Key actors in the development and deployment of AWS are the engineers from military affiliated government contractors and military personnel which each have differing interests when developing and deploying these technologies. Military personnel have goals to mitigate risk to soldiers and increase the effectiveness of military operations. While the engineers under control of military affiliated government contractors are not directly interacting with military forces, therefore their motivation to develop these systems may be encouraged by business

transactions. These actors' differing focus' on operational efficiency and business driven motivation lead to the neglect of ethical examination in times of conflict, such as the potential for autonomous weapons to cause civilian casualties or violate international humanitarian law (Roff and Moyes, 2018). This point made by Roff and Moyes highlights the need to consider the role of military personnel and engineers throughout the development and deployment of AWS. Thus, examining the ways ethical concerns are integrated into both the programming and building process, as well as the deployment and control of these systems. The development of these systems by the defense industry, as an actor in this network, brings about ethical concerns. Relating to the military-industrial complex, defense contractors play a crucial role in this network as they program and test these systems prior to being sold to the military for operation. Their programming and testing procedures may satisfy the guidelines they are given to sell their products, but their procedures may not adhere to the ethical and moral implications these systems must be tested to be operated responsibly under the LOAC (Cummings, 2018, et.al.). This causes a "domino effect" in the network, as the military personnel involved are not able to operate these systems to the fullest ethical extent, limiting their ability to operate efficiently under LOAC guidelines. The ethical concerns surrounding the military industrial complex have sparked a debate surrounding the social factors that affect the actors on the ground of the network in the development and deployment of AWS. Autonomous weapon systems are subject to the same political and cultural pressures as other military technologies, and their ethical implications are shaped by social and cultural factors (Gubrud, 2016). The ANT framework offers a lens to examine the social implications that surround AWS and to explore the ethical issues surrounding their use and the political decision making that guides it. The military-industrial complex has a vested interest in developing autonomous weapon systems as a means of reducing the risks to

soldiers and increasing the effectiveness of military operations (Taddeo and Floridi, 2018). These goals that accompany the military-industrial complex lead to a neglect of ethical considerations, leaving open the potential for autonomous weapon systems to cause unnecessary casualties or violate humanitarian law and the LOAC. The ANT framework allows for an examination of the social and cultural factors that shape the actors inscribed together in the network of development and deployment of AWS and the ways in which ethical considerations are integrated into military decision-making processes.

International organizations such as the United Nations have an important role to play in setting norms and standards for the development and use of autonomous weapon systems, to ensure that these technologies are developed in a way that is consistent with international humanitarian law and human rights (Müller and Abney, 2014). An example of this is the updates made to the DoD Directive 3000.09 to keep the regulations around autonomous weapon systems within line with the newest available technology (DoDD, 2017). With the most recent update published in January of 2023, the directive outlines the acknowledgements of advancements in technology that affects autonomous weapon systems and how the DoD aims to develop and deploy new systems, while also staying ahead of the curve with safety regulations. This displays how the changes are aimed at ensuring the commanders and operators can exercise appropriate levels of human judgment, as well as the additional screening and testing that were added to review of systems before being used in the field (DoDD, 2023).

Within the interconnected network of actors is the influence of public opinion and the media on decision making surrounding AWS in the political atmosphere. The decision-making process that is at the base of the network is made up of the public opinion on these systems and their use/affects on humanity and the media providing a platform through framing and agenda-

setting. Public opinion has a significant influence on the development and deployment of autonomous weapon systems. Negative perceptions of autonomous weapon systems can lead to reduced funding and increased regulation, while positive perceptions can lead to increased funding and deployment (Veruggio and Operto, 2016). The ANT framework allows for an examination of the ways in which the decision-making process leading up to the use of AWS is shaped by cultural factors, such as public opinion and media representation, as the two are actors in the network that build off one another. Public opinion is the micro foundation that can influence elite preferences, whether it is direct or indirect. The support or opposition of public opinion shapes the political decisions of military force. With AWS, the media provides the public with either the success or failure of these weapon systems, and the success of these systems is measured by the display of civilian and US military casualties, as they increase, opposition of the public appears to follow (Berinsky and Druckman, 2007). Past military conflicts are indicators of public opinion pushing the agenda for military tactics, in such events, public support has swayed in the way of safety and effectiveness for US military personnel. With this being the case, if media platforms display less loss of life of US troops, then the public opinion would act and vote in support of these systems for further use, even if they were to see the possible complications that accompany them. As stated by Horowitz (2016), "If autonomous weapons are like nuclear weapons and other systems, as their theoretical military utility increases, public opposition to autonomous weapons should decline because the public values effective weapons – even when they have qualms about those weapons" (p. 3). Therefore, with the media framing the results of AWS and the political agendas surrounding them, the public becomes enabled to influence military personnel's use of them. With the political decision makers as actors in the network that influence the direct actors (engineers, military commanding

officers and pilots), public opinion becomes the foundation of the network that drives the development and deployment of these systems.

Through this analysis it is evident that the ethics of autonomous weapon systems can be analyzed using the Actor-Network Theory framework, which emphasizes the importance of examining the relationships between human and non-human actors. The roles of military personnel, public opinion, media framing, and political agendas are inscribed together in a network with technology being displayed as the actant in the network. This network allows for the actors to be decompartmentalized and analyzed separately for their ethical implications, while also displaying the effect they have on each other in making up the network surrounding AWS.

Conclusion

This research project highlights the potential problems that autonomous weapon systems can pose with international humanitarian law and the United States Laws of Armed Conflict. The use of AWS by the US has several components pertaining to ethical considerations that allow development and deployment of these systems to be both safe and efficient for military personnel and society. This research also demonstrates how there are systems that are regulated under DoD directives that align with the Laws of Armed Conflict to ensure their safe and efficient use.

A future researcher could build upon this project by comparing how the United States approaches the use of autonomous weapon systems with other countries' usage. This research could uncover the rate of AWS production for other countries that do not follow international humanitarian law or have LOAC that regulate their development and usage. Through this, the US may be able to see the ways these countries are excelling in development and use similar

technology but find ways to alter it to stay within the LOAC. This would keep the US from falling behind in the technology development sector of AWS that we may be avoiding altogether due to ethical guidelines (while altering these developments to fit our ethical concerns).

In relation to this further research, researchers may be able to argue that the concerns for ethical implications in the development and deployment of AWS would become less of a concern by public opinion in the US if other countries began to engage in conflict and succeed at a greater rate because of this. This opinion would become similar to nuclear war dilemmas in the past, as researchers may believe that the US would lose their position as a military superpower if they were surpassed by other countries because of their lack of regulations in comparison to ours. However, pertaining to my research displaying the influence of the public opinion actor and the increase in unnecessary conflict surrounding AWS, the US ditching ethical consideration when using AWS would lead to more involvement of US troops in conflict and larger conflicts erupting globally. With the US being an ally to many countries because of their regulations and power, the increase in conflicts to compete with other countries would increase US military personnel and civilian casualties. Thus, my research refutes this argument, as the public opinion would not revert to increasing casualties and conflict, and the ethical way to compete in these conflicts would allow the US to remain a respected and powerful force while continuing to operate AWS.

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