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Introduction

Lethal autonomous weapon systems, or LAWS, are weapons that can select a target with the help of sensors and artificial intelligence and attack with little to no human intervention [1]. There are several economic, political, and social benefits to LAWS, but also there are risks and costs. Currently, there are no laws regulating these weapon systems, but most stakeholders are lobbying for a change in policy. This policy brief discusses three different potential states of policies: (1) no new policies to regulate LAWs, (2) a complete ban of LAWs, and (3) strict regulations regarding the use of LAWs. We recommend allowing the deployment of LAWS with strict regulations around their use and a mandated amount of human control.

The Grand Challenge

LAWS are weapons that require no human intervention to apply lethal force. This contrasts with human-supervised autonomous weapons, which allow for a human to remotely intervene in the weapon's operation at all times. The U.S. military is currently using unarmed autonomous systems, such as the Squad Mission Support System (SMSS), a vehicle designed to follow soldiers in the field while carrying supplies and equipment [2]. The U.S. military has developed and tested armed autonomous systems like the Have Raider, a "fully combat-capable F-16" that can operate without human input [3]. However, no LAWS are currently being used on the battlefield.

Current Policy

No international laws presently exist to regulate or prohibit LAWS. The United States is not against the use of LAWS but also does not currently own them. The U.S. might be compelled to develop them if their adversaries do so [4]. Russia has taken a more aggressive approach, stating that

research on LAWS is a top defense priority, for the advancement of science. On the other hand, 172 countries and organizations have come together to form The Campaign to Stop Killer Robots promoting a complete ban of "killer robots" [5].

Risks, Benefits and Ethics

LAWS, in the best case, can win wars efficiently. However, the lack of human intervention can lead to an unwanted loss of civilian life [6]. The increasing complexity of LAWS makes it difficult to test these weapons in challenging scenarios. The risk of LAWS suffering bugs, system failures or getting hacked also increases this level of unpredictability, leading to more risk in their deployment.

However, advancements in LAWS technology demonstrate that such systems can be much more precise and effective than humans. These systems can be designed to only fire once fired upon, helping reduce the risk of civilian casualties. LAWS also decrease financial costs of maintaining, training, or treating military personnel, allowing for a much cheaper alternative to soldiers. This approach leads to a reduction of the number of service members lost, making LAWS a viable, life-saving technology [7].

Even if LAWS can differentiate between targets, there still exists a significant ethical concern regarding the actual use of these systems. Even if LAWS are designed to follow a proper ethical code, such as properly distinguishing between civilians and combatants, the possibility for them being used improperly or unethically will continue to exist [8]. It is argued that the removal or partial removal of human decision making would lead to a "loss of dignity" for their human targets. In turn, this creates severe human rights concerns and unnecessary fear within civilian societies as there would no longer be humans making the decision to kill [9]. It is then argued that the best way to preserve humanity's dignity would be to control the algorithms designed for LAWS to retain a human-in-the-chain to preserve this accountability and avoid any moral wrongdoing [10].

Costs

The use and deployment of LAWS would inquire many economic, societal, psychological, and political costs. For economic costs, "global research spending on autonomous weapons and AI [artificial intelligence] is projected to reach $16 and $18 billion U.S. dollars respectively by the year 2025" [11], and autonomous weapons would need to be heavily regulated by an international body like the United Nations Security Council (UNSC), further adding to LAWS' monetary cost. Societal costs of LAWS would include the loss of "human dignity" and dehumanization of warfare caused by relegating the decision to kill a human being to a robot, causing a loss of responsibility and moral accountability for lives lost [12]. Autonomous weapons, as seen by existing research on the psychological effects of drones, could also create a large psychological toll for civilians anticipating an attack. Finally, according to a survey done by Ipsos, sixty-one percent (61%) of people are completely opposed to autonomous weapons [13]. This opposition, in addition to the thirty (30) countries that oppose the use of autonomous weapons [14], suggests that developing LAWS could harm domestic political careers and foreign diplomatic relations of policy makers that support LAWS.

Policy Alternatives and Recommendations

One option is to allow LAWS to exist under current laws of warfare. This would allow militaries to reap the full benefits of deploying autonomous weapons. LAWS could be designed to avoid ethical issues by being designed to only fire when fired upon, and to only be deployed where civilian casualties are unlikely (such as underwater or in space) [7]. Accountability for mishaps would fall on those who chose to deploy the weapons while knowing (or while they should have known) their risks. However, this would not prevent states or non-state actors from designing or deploying LAWS unethically and would make it difficult to restrict unethical use of these weapons.

There is also the option to completely prohibit autonomous weapons altogether, eliminating any risks that come with their use. Prohibition of autonomous weapons would also quell any ethical concerns around their use in warfare. However, the complete prohibition of autonomous weapons would have a large legislative toll, and it would take a large effort on both a national and global level to put prohibitions and treaties in place around the world. Along with this, any existing development and research on autonomous weapons would either need to be retooled or scrapped, creating additional monetary costs.

Finding a balance in terms of the regulation of LAWS will allow for the best combination of military benefits and ensuring the technology is used ethically. Compliance with International Humanitarian Law should be the basis of creating such policy regulations, and respect for human dignity can be preserved by retaining human control [15]. Policies that permit human operators to intervene in LAWS will allow for increased transparency in terms of accountability when a user or party needs to be identified. This brief recommends this balanced approach, proposing that international regulation requiring human supervision for autonomous weapons be created and enforced.

Without any major agreements, it will be difficult to ensure the risks and dangers of autonomous weapons are mitigated. There are several directions the policies can go. The first option would be to let the current state of policy remain and trust the developers of LAWS to use them ethically. Another option would be to completely ban their development and deployment. The final option, that we recommend, would be to enforce strict regulations on the use of LAWS to prevent unethical use and also to prevent the toll of enforcing a complete ban.

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