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Autonomous Weapons Systems

Today, we see an extremely rapid development of technology that we have never seen before in the history of human kind. With the invention of computers, we now readily have access to knowledge that would have taken us many more generations to discover otherwise. Modern computers can perform, in one second, billions of arithmetic and logical operations that would take humans entire lifetimes (Otake, 2012). Due to this fast growth of computer technology, the human species have begun to face a series of significant existential risks that we were not able to foresee just a generation or two ago. These are the risks posed by artificial intelligence (AI). Some of the most plausible and immediate existential risks posed by further development of AIs are due to the use of this technology in warfare and other military purposes: the development of autonomous weapons systems. Despite these risks, I believe that the potential benefits of developing militaristic AI technology are far greater than their dangers, and I moreover argue that we should continue the development of autonomous weapons systems under the condition that researchers pay significant attention to the risks involved and propose preventive measures for them.

To begin with, critics of AI point to the potential added damage from using this technology for militaristic purposes. In many developed countries, the military has already begun to fund AI research to manufacture autonomous weapons (Haridy, 2018). These killer robots, if successfully brought to life, would be able to select and engage targets without human

intervention (University of Pennsylvania Law School, 2014). Noel Sharkey, among other notable computer scientists, argue that it would be very challenging for autonomous weapons systems to distinguish civilians from combatants (Sharkey, 2010). This means that using autonomous weapons in the battle field may create more unnecessary deaths and damages during warfare. Moreover, autonomous weapons are designed to be far more powerful and far more successful at killing its targets compared to human soldiers (Etzioni & Etzioni, 2017). Thus, programmatical errors in the selection of targets would create mass collateral damage on an unimaginable and uncontrollable scale. Some people anticipate further catastrophes at a global level. Many robotics researchers view the development of militaristic AI technology as the third revolution in warfare, following gunpowder and nuclear weapons, arguing that the development of autonomous weapons systems will soon cause a global arms race with the potential to wipe out the human race (Tegmark, 2015). In addition, they claim that this type of global arms race may lead to autonomous weapons being used as the medium of a disastrous terroristic attack or some other malicious activity. Based on these risks, many critics argue that militaristic AI research should be regulated if not banned altogether (Etzioni & Etzioni, 2017).

Yet, there are clear advantages to adopting militaristic AI technology in our society. Where combat is necessary, autonomous weapons would be able to replace people in dangerous situations (Marchant et al., 2014). If robots could be put on military missions instead of human soldiers, the number of casualties would decrease significantly, and if the police force adopts this technology, it would put fewer officers at risk. Additionally, the problem of autonomous weapons systems not being able to distinguish between civilians and combatants could be largely alleviated if we can remove humans from the battle field altogether. Thus, the development of militaristic AI technology should be an international effort so that the transition from humans to

AIs in the battle field can be carried out smoothly without causing a global AI arms race. Furthermore, robotic AIs would be able to take on missions that involve areas inaccessible to humans. For instance, autonomous weapons would be able to perform military tasks for prolonged periods of time without resources like food or water and conduct military missions in radioactive areas or under other conditions harmful to humans. Therefore, by replacing humans with autonomous weapons, we can reduce the number of deaths in the battle field and expand the potential areas for which military missions can be carried out.

Nonetheless, critics often bring up the concern that AIs, thus far, do not possess emotions or the ability to make decisions based on ethics (Thagard, 2017). Although computers are far beyond us in performing arithmetic operations, logical decision-making, and memory, many computer scientists believe that we would not be able to come up with a non-organic algorithm to make ethical decisions, because certain biological functions like emotions are unique to living organisms (Alasaarela, 2017). If the AI is given a military task, it could take extremely unethical courses of action to achieve the goal more efficiently. As an example, if a target enemy is in an area surrounded by hundreds of innocent people, it is unlikely that a human soldier would make the decision to bomb the entire area down to kill the one enemy along with the civilians, but an autonomous weapon might if it decides that that is the most efficient method of killing the target. The fact that these AIs carry tremendous militaristic power is all the more terrifying when these robots lack the ability to make decisions that seem fairly straightforward for human beings. Judging from these risks, critics of autonomous weapons conclude that, at the very least, decision-making in the battle field should be left in the hands of humans.

However, removing the decision-making abilities from autonomous weapons defeats the entire purpose of developing AIs in the first place. If humans were still required to intervene for

these robots to perform their military tasks, we would have failed to remove humans from dangerous situations, and the militaristic advantages of using autonomous weapons become limited by the decision-making abilities of the people in charge. The greatest benefits to society are only realized when AIs develop the ability to perform all militaristic actions, including decision-making, at a higher level than human beings. Fortunately, many military officials think that the AIs' ability to make logical decisions without being swayed by emotions is an advantage, not a drawback. If the autonomous weapons are programmed correctly, they would be able to perform military tasks much more efficiently without introducing opportunities for human error. According to Major DeSon of the U.S. Air Force, fighter pilots are vulnerable to fatigue and mental exhaustion due to the extreme high-G conditions in which they maneuver the airplanes and are thus more likely to make errors than robot pilots which are not subject to these physiological constraints (DeSon, 2015). Many other military leaders also point to the mental weaknesses of human beings which are followed by the inability to make logical decisions in the battle field (Etzioni & Etzioni, 2017). Thus, the fact that AIs lack emotions and other human-like senses may actually be beneficial under extreme conditions in the battle field.

Furthermore, some researchers are currently working on coding "emotional intelligence" into AIs and some optimists have hope that they may even devise an algorithm that is more emotionally intelligent than human beings. These emotional intelligence researchers believe that since emotions and ethical decision-making skills are organic algorithms that evolved over millions of years in humans and other living organisms, they should theoretically be able to reverse-engineer an accurate computer algorithm for them (Alasaarela, 2017). In fact, computers are already much better than people at sensing human emotions from facial feature and voice recognition. On top of that, they claim that humans are generally not emotionally intelligent due

to our natural selfishness and inability to understand each other emotionally. Hence, autonomous weapons would not only be better soldiers but better decision-makers in the battle field.

All in all, the potential future advantages of autonomous weapons systems outweigh the immediate risks posed by developing this type of militaristic AI technology. Although autonomous weapons have the potential to create mass collateral damage, we would be able to remove humans from risky situations altogether by letting AIs take on those dangerous roles. Also, the logical functions of AIs are far superior to those of humans, and we even have the potential to develop emotional intelligence in AIs giving them much better decision-making skills in the battle field. Eventually, as we develop these high-level militaristic AI technology, we would want these AIs to be in charge of our military sector and oversee our security systems. As AIs replace people in these executive roles, we can mitigate the possibility of human errors in these sectors, which would bring a tremendous advantage to our public safety.

References

Alasaarela, M. (2017, October 09). The Rise of Emotionally Intelligent AI – Machine Learnings. Retrieved April 16, 2018, from https://machinelearnings.co/the-rise-of-emotionally-intelligent-ai-fb9a814a630e

DeSon, J. (2015). AUTOMATING THE RIGHT STUFF? THE HIDDEN RAMIFICATIONS OF ENSURING AUTONOMOUS AERIAL WEAPON SYSTEMS COMPLY WITH INTERNATIONAL HUMANITARIAN LAW. The Air Force Law Review, 72, 82-122. Retrieved April 16, 2018, from http://www.afjag.af.mil/Portals/77/documents/AFD-150721-006.pdf

Etzioni, A., & Etzioni, O. (2017, May/June). Pros and Cons of Autonomous Weapons Systems. Retrieved April 16, 2018, from http://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/May-June-2017/Pros-and-Cons-of-Autonomous-Weapons-Systems/

Haridy, R. (2018, February 26). South Korea establishes research center to develop autonomous weapons. New Atlas. Retrieved April 16, 2018, from https://newatlas.com/korea-ai-weapons-military-kaist-hanwha/53576/

Marchant, G. E., Allenby, B., Arkin, R. C., Borenstein, J., Gaudet, L. M., Kittrie, O., . . . Silberman, J. (2014). International Governance of Autonomous Military Robots. Handbook of Unmanned Aerial Vehicles, 2879-2910. doi:10.1007/978-90-481-9707-1_102

Otake, T. (2012, February 12). 10,000,000,000,000,000 calculations per second. The Japan Times. Retrieved April 16, 2018, from https://www.japantimes.co.jp/life/2012/02/12/general/10000000000000000-calculations-per-second/#.WufrxdPwbVo

Sharkey, N. (2010). Saying 'No!' to Lethal Autonomous Targeting. Journal of Military Ethics, 9(4), 369-383. doi:10.1080/15027570.2010.537903

Tegmark, M. (2015, July 28). Open Letter on Autonomous Weapons. Retrieved April 16, 2018, from https://futureoflife.org/open-letter-autonomous-weapons/

Thagard, P. (2017, December 14). Will Robots Ever Have Emotions? Psychology Today. Retrieved April 16, 2018, from https://www.psychologytoday.com/us/blog/hot-thought/201712/will-robots-ever-have-emotions

University of Pennsylvania Law School. (2014, November 22). The Ethics of Autonomous Weapons Systems . Retrieved April 16, 2018, from https://www.law.upenn.edu/institutes/cerl/conferences/ethicsofweapons/