Ethical Implications of Autonomous AI Robotics in War

Artificial intelligence has evolved to an exceptional level in the last few years. AI research is touted by some as the next big ethical issue of our time. Specifically, AI in robots when used in war situations - is it ethical to use advanced robotic AI to aid in the targeting and subsequently killing of fellow human beings? The debate surrounds whether the protection of allied lives vs enemies is more important than the implication of autonomously killing human beings and whether lower risks involved with autonomous AI combat may contribute to an increase in needless violence. While some believe that employing this system will reduce loss of life due to the efficient nature of machines, others believe the implications are far worse than any benefits. The use of advanced AI driven weapons in war is ethically wrong, and leads to sharp implications for the general public. Sharkley puts it, “Robots for care and for war represent just two of many ethically problematic areas that will soon arise from the rapid increase and spreading diversity of robotics applications.” (Sharkley, 2008) This could very well may turn into the biggest ethical conversation of our time.

Mankind has always progressed from the manual to the automated. Even as early as domesticating the farm animal to help in plowing fields of crops. Machine technology in the industrial revolution was no different, and there is nothing slowing us down. The first robotics to be used in war dated back as early as World War II. Developed by Russians the “teletank” was the modern drone of its time. Named the Teletank for its ability to be controlled via remote control by a set of rods and levers. ("*Teletanks Soviet second world | Encyclopedia of safety*," n.d.) These tanks were unmanned and could be controlled from nearly one mile away and contained standard machine guns and flamethrowers (Michel, 2013). The Russians used these tanks in battle as well, according to Bair Irincheev “From the outside, a teletank looked like a regular chemical tank: the only difference was the presence of a second antenna on the turret.” He goes onto say “The 217th Detached Tank Battalion fielded eight battle pairs in the Battle of Summa in December 1939-February 1940.” (Irincheev, 2012). The German unmanned war machine was not far behind Russia, unveiling their Goliath unmanned ground vehicle. The Goliath was another radio controlled tracked-vehicle that contained a load of explosives. These tanks were used by the Germans in World War II to destroy bunkers or enemy vehicles. (*Goliath Demolition Tank*, 2010) These vehicles were the first of their kind, it wasn’t until the British developed their Morfax Wheelbarrow in 1972 that we entered the modern era of autonomous robotics. The Wheelbarrow technology is still in use today in modern scenarios to safely dispose of active ordinance. According to The Telegraph (Smith, 2001) “The device is estimated to have saved hundreds of lives since its introduction in early 1972. It is still in service, but more than 400 have been destroyed in action - each one representing at least one life.”

Unmanned Aerial Vehicles or UAVs was the next frontier in autonomous wartime weapons. Even though UAVs were arguably developed before UAGs (Unmanned Ground Vehicles), it wasn’t until the Cold war did the “drone” revolution begin. The most notable start to this evolution was an aircraft called the Ryan Firebee, named after the creator of Ryan Aeronautical Company (Clark, 2000). Fully modernized UAVs started showing up in the late 1980s after being used in the Israeli Airforce (azom.com, 2013). Since then, UAVs have been used extensively in the United States to carry out targeted strikes in warzone areas of the world such as Afghanistan and Iraq.

How can we begin evaluating the issues posed by autonomous war machines? One of the bigger issues arises from responsibility and legality. If a robot is built to make decisions without the conscious human directly controlling it, who is to blame when something goes wrong? We run the risk as a species of creating a cognitive dissonance in a scenario that would warrant a full conscious mind. The ramifications of looking the other way as a robot carries out the violent acts of war is too high. If an AI was to make a decision that would go against better judgement the consequences are not trivial when dealing with human life. Where does the responsibility lie with the mistakes of artificial intelligence? According to the report Autonomous military robotics: Risk, ethics, and design (Lin, 2008) “It may be possible to simply stipulate a chain of responsibility, e.g., the commanding officer is ultimately responsible. But this may oversimplify matters, e.g., inadequate testing allowed a design problem to slip by and caused the improper robotic behavior, in which case perhaps a procurement officer or the manufacturer ought to be responsible.” At what point does the responsibility not fall under the commanding official and fall under the designer/manufacturer. Furthermore, what will the legal implications of such issues be? This is a space that has no legislation and “more work will be needed to clarify the law for a clear framework in matters of responsibility.”

The second problem with autonomous robots in war is convenience. Earlier it was brought up how this autonomy could bring cognitive dissonance to the people fighting wars behind robots. Even though allied lives are spared by using robots, armed conflicts become an easier decision. When there is no risk of loss of life on your own side, there is hardly incentives to not start a conflict. This, in turn, lowers the barrier of entry for war (Lin, 2008). Abney states “But the considered objection—that advanced robotics immorally lowers barriers for war—hides a logical implication that we should not do anything that makes armed conflict more palatable.” Abney is saying that technology already lowers the barriers for war and the counterintuitive assumption that we should make war as barbaric as possible in order to raise these barriers. One ought to assert that as long as machines aren’t making the decisions in battle there will always be the psychological aspect of war. The current state of AI moral decision making is not up to the task nor is qualified to operate fully autonomously. This is not to say advanced artificial intelligence won’t one day prove better than human decision making. Even at that day we will still be faced with these ethical dilemmas.

The other side of the argument supposes the exact opposite. That in developing the autonomous robotics it will strengthen our national security. (Groves, 2015) Writes about Lethal Autonomous Weapons Systems (LAWS) as being an essential step forward, “Moreover, LAWS have the potential to increase U.S. effectiveness on the battlefield while decreasing collateral damage and loss of human life. Advanced sensors may be more precise in targeting a military objective than a manned system, and LAWS may perform better than humans in dangerous environments where a human combatant may act out of fear or rage.” Others argue quite simply that if by using robotics as weapons means saving the lives of our men women and children there is no reason not to use them. Since robotics though callous, are very precise. By their precision one can assert there would be less civilian casualties and collateral damage. The New York Times released an article that goes on to say “if an A.I. weapons system can get a dangerous job done in the place of a human, we have a moral obligation to use it.” (Kaplan, 2015) These are all fair points, and there are more benefits of autonomous robots in war that won’t be discussed in this paper. It is important to note that with all benefits come downsides and implications – the quintessential question is, do the pros outweigh the cons?

There is a major implication of using autonomous weapons against enemies that some people may not realize. The general public tends not to worry about these types of advancements because the weapons aren’t pointed at them. Imagine a world where a computer was able to dictate whether you lived or died, right then – and at that moment. Arguably you have no great way of defending yourself, or rather, you would have much better odds against a human. It simply follows that if the use of advanced AI in warfare is a great success, those same effective methods will be used in a domestic setting. There is already evidence of that today, consider the letter released by the FBI in response to an inquiry by Senator Ron Paul: (Kelly, 2013) “The FBI uses UAVs [Unmanned Aircraft Vehicles] in very limited circumstances to conduct surveillance when there is a specific, operational need.” The FBI has already started using proven successful technology that just a few years ago was used to target and destroy enemies in Afghanistan. Stephen Kelly, the assistant director of the Office of Congressional Affairs, goes on to state: “we are not in a position to disclose publicly more detailed information concerning the Bureau’s specific use of UAVs.” One’s first reaction to this letter is realizing that the use of UAVs in the assistance of finding kidnaped children, violent criminals, etc. is a completely reasonable use of this technology. One should not assert this is misuse in any way, simply that, as AI becomes a more advanced tool in war – it follows it will become more utilized stateside. Now I repeat the original statement that the general public does not quite understand the full implications of autonomous AI weapons because it is not being used against them. The general public doesn’t understand how powerful these machines have the potential to become, not because they are uneducated, but because they haven’t seen it used. In some ways, fully autonomous law enforcement might be inevitable if we are allowed to continue pioneering the field of autonomous war and advanced AI driven weapons. In this specific case the FBI used UAV technology to rescue a five-year-old boy from kidnappers where, if no UAV technology was available, might not have been possible. In this, one can see the benefits of using this type of tech, but at what cost if left unchecked? We as a country and species need to set strict guidelines on use cases for robotics, and as we draw closer to AI driven weapons, we need to be even more diligent to those changes.

Now we have evolved as a species to develop fully autonomous robots capable of many things. In many cases this is a good thing, in some cases – not so good. History has a large amount of evidence supporting my claim that fully autonomous vehicles of war (robots) has caused issues. Just in 2007 an automated anti-aircraft cannon injured fourteen people and killed nine. This was claimed to be a malfunction of the machinery which caused the targeting system to fail. It subsequently aimlessly fired canon rounds, and without human intervention, was not able to be stopped in time. There are many cases where innocent lives have been lost because there was not human judgment involved. When discussing autonomous AI, by definition, a human is not in the loop. It may be necessary to keep a human in the loop as to oversee some of the finer technical problems that are bound to happen. Saying that human judgement is flawless would be naïve, however, one knows who to blame in that event. If we consider a smarter AI in a fully autonomous robot, who takes responsibility for a robot’s judgement?

There has been somewhat of a public outcry from U.S. citizens and experts alike. An open letter was created and signed started by AI researchers to ban autonomous weapons. Notable figures like Elon Musk, CEO and founder of Tesla motors and Stephen Hawking astrophysicist. This was signed to date by myself and 20,805 others. This includes 3,105 AI researchers. ("FLI - Future of Life Institute | Open Letter on Autonomous Weapons," 2015) “Just as most chemists and biologists have no interest in building chemical or biological weapons, most AI researchers have no interest in building AI weapons — and do not want others to tarnish their field by doing so, potentially creating a major public backlash against AI that curtails its future societal benefits.” This is the response from the scientist and engineering community against the AI arms race that could potentially spawn between nations. If one wants to get involved with preventing autonomous weapons they need to look no further than signing these online petitions or writing to your congressperson. Another way one can get involved is joining the Campaign to Stop Killer Robots www.stopkillerrobots.org. At their website one can get all the information about recent progress in the world of autonomous warfighting.

The main issue with banning AI weapons just in the United States is the potential for other countries to become more advanced where if a conflict should arise, we would be at a disadvantage. This is why we would need an international effort to ban the use of autonomous weapons in war. This isn’t the first time banning certain weapon systems has been proposed on the international table. Land mines were one of the first unmanned weapons that got a lot of attention. In 1997 the Ottawa Treaty was introduced to ban land mines. But the U.S. did not back this legislation due to other international pressures. (Sukman, 2016) “The United States has not signed the Mine Ban Treaty of 1997 due to the need, in conjunction with South Korea, to use mines to defend the inter-Korean border.” According to Sukman, recent policy changes have been led by the movement to “stop the killer robots” and started having debates on the issue in March of 2013. The United States is still not complying with some international pressure to instate a ban on autonomous weapons.

There are large ethical, social, and legal dilemmas involving autonomous robotics. I do not believe we can reconcile these issues within the mid-term future. There are of course benefits to using robotics in warfare – and even autonomous robotics. But I feel when you begin to weaponized such systems the issue lies less in application and more in ethics. The military and scientific community are taking this issue seriously. A research effort was conducted by Ronald Arkin and Lilia Moshkina at Georgia Institute of Technology to address some ethical concerns. (Arkin, 2007) Arkin proposes two topics of investigation when dealing with robots in battle situations, what is acceptable – and what can be done. First they plan to get an idea for what is acceptable behavior for autonomous warfighting robots. They will construct a survey of “public, robotics researchers, policymakers, and military personnel to ascertain the current point-of-view maintained by various demographic groups on this subject.” The second plan is to figure out what needs to be done to keep AI and robotics in line with the expectations of the first topic (what is acceptable). As Sullins puts it in his paper (Sullins, 2002): “As a preliminary step in that direction I would like to argue that the ethical status of autonomous robots, both as ethical agents and objects of ethical consideration, be based on, but not identical to, the ethical status of their makers, operators, and those people and other machines that will interact with them.”

As stated before, automated robots and AI have far reaching benefits in a non-military setting. Technology has progressed to the point of automation ever since the industrial revolution and AI in robotics is another evolutionary step on that chain. There is no slowing it down, nor should one try to slow down the progression. Some may argue that these robots in the future will take away jobs from hard working citizens. It is hard to sympathize with those people from a business sense since salaries are one of the biggest costs in any corporation. Advanced AI has some of the great future potential for our species. Imagine trying to solve a major problem or calculation that our minds can simply not comprehend. A super AI with more processing power than 1 billion minds could crunch away all the permutations of a calculation and determine the best course of action. Super intelligent AI could be the answer to some of the most vexing answers in the universe. This is why we as a species should protect this powerful construct. Even when excluding the use of weapons systems for AI, one still has to consider consequences to developing a super intelligent AI in the first place. If a super AIs job is to fix a major problem on the planet and the only solution is to impede with the values of mankind, then we would have created an enemy to our species. It follows that if a super intelligent AI started to change the way our planet operates that directly goes against the common sense of humanity we would be unlikely to “turn off” such a super intelligent process. At that point it will likely predict it is being turned off and that would contradict its mission and therefore shield itself. We have to be sure that whatever parameters we give a super intelligent AI; humans must be a part of it. Or rather, our values must coincide with the parameters of the mission. If we work together with AI we will be able to keep the world a safe place. Now if you consider the former consequences and also introduce the same AI possessing the capability of lethal weapons – it becomes terrifying.

I do not feel like autonomous weapons should be used in warfare. Much like biological weapons such as mustard gas in world war I, robotics proves a major disadvantage in the field of battle. There is a reason chemical weapons are banned in the rules of war by the Geneva convention. I believe banning such advanced autonomous systems when used in armed conflicts is merited and necessary. The study of AI and autonomous robots is not the subject of my argument, the benefits of AI are unlimited for societies around the world. The line has to be drawn when we give these seemingly moral agents their own weapons and design an algorithm on how to use those weapons. Furthermore, what would happen if these advanced systems were to be turned around on civilians like us? Would we be able to fight back when faced against an army of self-sufficient robots? It is important to note I am not taking this to the extreme case, it is a very real possibility that once systems like these are proved successful in the battlefield they will make it back to civilian use. The people who argue that it is in the national security interest of the United States to push forward with AI weapon development should know that, if banned internationally, that would not be an issue. We should take note from important experts like Elon Musk, Stephen Hawking and Steve Wozniak who urge that AI technology could be the next revolution in warfare – such as nuclear weapons. I, for one, would love to see the field of AI grow beyond my imagination. I do not, however, want to see such a beautiful feat of ingenuity and engineering go to waste, after all – wouldn’t it just make us less human?

References

Arkin, R. C., & Moshkina, L. (2007). *Lethality and autonomous robots: An ethical stance*(ADA468122). Retrieved from Georgia Institute of Technology website: http://www.cc.gatech.edu/ai/robot-lab/online-publications/ArkinMoshkinaISTAS.pdf

Azom.com staff writers. (2013, October 18). Unmanned Aerial Vehicles (UAVs) – Overview, History and Market. Retrieved from http://www.azom.com/article.aspx?ArticleID=10156

Clark, R. M., & Air University (U.S.). (2000). Uninhabited combat aerial vehicles: Airpower by the people, for the people, but not with the people. Maxwell Air Force Base, AL: Air University Press.

FLI - Future of Life Institute | Open Letter on Autonomous Weapons. (2015, July 28). Retrieved from http://futureoflife.org/open-letter-autonomous-weapons/#signatories

Goliath Demolition Tank [Video file]. (2010, October 29). Retrieved from https://www.youtube.com/watch?v=zhK8L0PgPdA

Groves, S. (2015, March 5). The U.S. should oppose the U.N.’s attempt to ban lethal autonomous weapons (LAWS). Retrieved from http://www.heritage.org/research/reports/2015/03/the-us-should-oppose-the-uns-attempt-to-ban-autonomous-weapons

Irincheev, B. (2012). Plans and preparations. In War of the white death: Finland against the Soviet Union, 1939-40. Mechanicsburg, PA: Stackpole Books.

Kaplan, J. (2015, August 17). Robot Weapons: What's the Harm? - The New York Times. Retrieved from http://www.nytimes.com/2015/08/17/opinion/robot-weapons-whats-the-harm.html

Kelly, S. D. (2013). Federal Bureau of Investigation. Retrieved from Ron Paul website: http://www.paul.senate.gov/files/documents/071913FBIresponse.pdf

Lin, P., Bekey, G., & Abney, K. (2008). *Autonomous military robotics: Risk, ethics, and design*. Retrieved from California Polytechnic State Univ San Luis Obispo website: http://www.dtic.mil/cgi-bin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA534697

Michel, A. H. (2013, November 3). Out of the Shadows: The Strange World of Ground Drones – Center for the Study of the Drone. Retrieved from http://dronecenter.bard.edu/shadows-strange-world-ground-drones/

Sharkey, N. (2008). COMPUTER SCIENCE: The Ethical Frontiers of Robotics. *Science*,*322*(5909), 1800-1801. doi:10.1126/science.1164582

Smith, M. (2001, April 16). Calls to honour inventor of bomb disposal device - Telegraph. Retrieved from http://www.telegraph.co.uk/news/uknews/1316277/Calls-to-honour-inventor-of-bomb-disposal-device.html

Sukman, D. (2016, January 13). Lethal Autonomous Systems and the Future of Warfare / ISN. Retrieved from http://www.isn.ethz.ch/Digital-Library/Articles/Detail/?id=195492

Sullins, J. P. (2002). Sonoma State University. *The ambiguous ethical status of autonomous robots*, 2. Retrieved from http://www.academia.edu/202045/The\_Ambiguous\_Ethical\_Status\_of\_Autonomous\_Robot

Teletanks Soviet second world | Encyclopedia of safety. (n.d.). Retrieved from http://survincity.com/2012/05/teletanks-soviet-second-world/