

Artificial Intelligence and National Security

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Abstract

This research paper will attempt to identify and understand why the relationship of artificial intelligence and national security is integral for the United States of America and the world. Included in this research paper is “Artificial Intelligence and National Security” by Daniel S. Hoadley and Nathan J. Lucas¹, “Artificial Intelligence and National Security” by Greg Allen and Taniel Chan², “Implications for Global and National Security” by Ahmad Khan and Irteza Imam³, “Artificial Intelligence and Security” by Prof. Radulov, N., PhD.⁴, “Artificial Intelligence & Autonomy” by Andrew⁵, “Artificial Intelligence for Long-Term Robot Autonomy: A Survey” by Lars Kunze⁶ and “Artificial Intelligence and The Problem of Autonomy” by Simon Chesterman⁷. These research papers pinpoint how the use of AI has greatly benefited the average American by improving national security and how in either the long term and/or term future of AI development and its autonomy will change life as we know it to be.

¹ Allen, Greg, Taniel Chan, Joseph S. Nye, Gautam Mukunda, Matthew Bunn, and John S. Park. *Artificial Intelligence and National Security*, 2017.

² “Artificial Intelligence and National Security.” Accessed October 20, 2021.
<https://crsreports.congress.gov/product/pdf/R/R45178/3>.

³ “Role of Artificial Intelligence in Defence ... - ISSI.ORG.PK.” Accessed October 20, 2021. http://issi.org.pk/wp-content/uploads/2021/05/2_SS_Ahmad-Khan_and_Irteza-Imam_and_Adeela_Azam_No-1_2021.pdf.

⁴ “Artificial Intelligence and Security. Security 4.” Accessed October 20, 2021.
<https://stumejournals.com/journals/confsec/2019/1/3.full.pdf>.

⁵ “Artificial Intelligence & Autonomy - DTIC.” Accessed December 3, 2021.
<https://apps.dtic.mil/sti/pdfs/AD1041749.pdf>.

⁶ “Artificial Intelligence for Long-Term Robot Autonomy: A Survey.” IEEE Xplore. Accessed December 3, 2021.
https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8421618&casa_token=MN-dKLkP-IEAAAAA%3AHSnSBcBVKRHeAtf4MrcQEF490fwLKZTzDcKzxVD7IMwI8OKyKqhL2Cam4BydiVn9tWXwQo_hWZ0&tag=1.

⁷ Chesterman, Simon. “Artificial Intelligence and the Problem of Autonomy.” SSRN, September 16, 2019.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3450540.

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Introduction

Advancements in technology have led to a world in which, cyberspace has no borders or boundaries, this has also had other unforeseen consequences. Artificial Intelligence and national security have become an integral part of our world for many different reasons. This research paper will attempt to point out every single aspect as to why moving forward we need to understand the relationship between these two to have a success future. Artificial intelligence is defined as the ability for a machine to copy human intelligence and behavior. On other hand, national security is defined as the ability of a state to provide protection and defense of its citizen population. The overlap for these two occurred when artificial intelligence became a focal argument for automation in the public and private sectors of society. This kicked off a systematic change on how traditional labor jobs, software systems would behave and how weapons systems would be developed. The second section of this research paper will attempt to understand robotic autonomy's impact on the world using current everyday laws for everyday tasks. Who should be

⁸ *Merriam-Webster.com Dictionary*, s.v. "artificial intelligence," accessed October 18, 2021, <https://www.merriam-webster.com/dictionary/artificial%20intelligence>.

⁹ "National Security Versus Global Security." United Nations. United Nations. Accessed October 18, 2021. <https://www.un.org/en/chronicle/article/national-security-versus-global-security>.

¹⁰ *Merriam-Webster.com Dictionary*, s.v. "machine learning," accessed October 19, 2021, <https://www.merriam-webster.com/dictionary/machine%20learning>.

¹¹ *Merriam-Webster.com Dictionary*, s.v. "research and development," accessed October 20, 2021, <https://www.merriam-webster.com/dictionary/research%20and%20development>.

¹² *Merriam-Webster.com Dictionary*, s.v. "big data," accessed October 23, 2021, <https://www.merriam-webster.com/dictionary/big%20data>.

held accountable for the actions of robots once they are in control rather than humans. Also, how does robotic autonomy affect national security through its implementation in smart mission critical weapons systems. What are the current laws in place and how would they have to change in order to accept robot autonomy.

Literature Review

Current research has a very good understanding on how AI research and national security have grown to be a very important, although the future of AI in different fields is still greatly unknown. For example, the research done by Pro. Radulov in “Artificial Intelligence and Security” claims that in the future forced labor will be a sector in which AI could help. Although while AI is changing, and it is improving at detecting crimes as shown in all the research papers. Big data is always the core for AI to be able to function with good accuracy and reliability and current research shows that forced labor for logistical supply chains like agriculture for example barely make up 10 percent of recorded crime and even worst sweatshop factory forced labor is only measured at 6 percent¹³. Therefore, the fact is that these numbers may not represent the real world, but the point here is that it is very hard to measure these types of crimes. The research paper here failed to identify how data will be captured for these types of crimes, often the data comes after the fact for these types of crimes. After the fact here represents law enforcement and researchers going into the data and manually trying to paint a picture unlike other crimes where it comes from criminals who use servers with big data to operate.

¹³ Bales, Kevin, Laurel Fletcher, and Eric Stover. “Hidden Slaves: Forced Labor in the United States.” eScholarship, University of California, August 7, 2009. <https://escholarship.org/uc/item/4jn4j0qg>.

Military & US Nation

Artificial intelligence development is stated to be on par with the development and invention of aircraft and nuclear weapons. Artificial intelligence's main roles deal with military superiority, information superiority and economic superiority. Therefore, it is important to understand how Artificial intelligence can accomplish these objectives and why it should. Military superiority is without a doubt the single and most important aspect to being able to provide security and safety for a nation. The military has begun to use artificial intelligence in several different aspects to assist decision makers on what their next step should be in the battlefield given the circumstances. These solutions not only include just software-based development but also include hardware like drone hardware for long range espionage, and airstrikes. This means that the artificial intelligence inside the drone would be able to make decisions on its own given its software ability to make decisions on the fly without human operators. Decisions whether it is safe to fly into a certain air space given the speed of flight or the altitude.

Information superiority is a key position of Artificial intelligence because it could be used to search through large amounts of data faster than any human would be able to. The key difference between software solutions that just sorts data to let humans manually read it, artificial intelligence can understand it and output outcomes within seconds or minutes depending on the data. Artificial intelligence algorithms could also spot trends in big data that humans may not be able to. This is in hand with national security and economic superiority because spotting trends early in big data that may be a risk to nation security is important. An example would be the American economy, algorithms can be developed to spot changes in many different departments when the changes exceed certain boundaries they can alert for human attention. If an event could

trigger a recession in the US economy that is national security because that would mean thousands of Americans could be unemployed. This is a threat because it would put the nation at an economic disadvantage compared to the rest of the world, and it could create a uncommonly within the nation between citizens which slows down overall economic activity and national security. The US military could be affected if government leaders were to take a more budget cutting approach to security which means less research and development for new weapons and less global military presence around the global. With less oversight by the US military other nations then would be able to develop more powerful weapons of greater destruction than that in the US arsenal.

Cost

The artificial intelligence market value of 21 billion dollars (USD) in 2018 is expected to grow 9-fold throughout 2025¹⁴. In history, one of the biggest contributing factors to cost has been the speed of development for new weapons and tools. This is still an important factor, but AI can do something faster with the same results that reduces cost and allows business or the government to operate a step ahead of the rest. This is possible because unlike past times, development now can be rendered and simulated through a machine rather than testing multiple versions of an object or software. Artificial intelligence assists in this by again using data driven predictions, a missile that may be wrongly configured for stable flight can be spotted with AI since it understands the parameters in which an object needs to obey to fly. A human designer and researcher can do the same task, but they would need to examine different sections and develop prototypes while artificial intelligence can just read the data. A drone may cost \$1,000 today but

¹⁴ “Magic Bullets: The Future of Artificial Intelligence in Weapons Systems.” [www.army.mil](https://www.army.mil/article/223026/magic_bullets_the_future_of_artificial_intelligence_in_weapons_systems). Accessed October 20, 2021.
https://www.army.mil/article/223026/magic_bullets_the_future_of_artificial_intelligence_in_weapons_systems.

with a 95% decline of cost due to this model, it is predictable that the same or equal equipment may cost \$50 in the future.¹⁵ This is a national security importance since cheaper and more attack and defense equipment rolling out of production faster means a safer nation for US citizens.

Autonomy

Artificial intelligence continues to grow each day that passes therefore it is inevitable that computers will surpass the human's ability to perform tasks were most actions are predictable with little to no errors. Current ship vessel and motor vehicle laws are meant to function through the lens that a human operator is in control and therefore they are responsible for the actions committed with the controls. What happens to the responsibility when a robot AI substitutes a human, who is accountable for the actions committed¹⁶. Currently certain laws state that there should be a driver, what happens when autonomy surprises the human's ability to function either ships or cars error free. What qualifies as a driver, is it the ability to drive or does it mean a human behind the wheel. Currently there are six levels to car autonomy and at level zero we have the standard version of current life for many around the world the human has complete control. Level one cruise control is the main feature where the vehicle has very strict use scenarios, but it does have control the speeds speed and braking systems. Level two is where a lot of newer cars with auto pilot features reside, level two enables the automation software which is powered through AI and machine learning to control the vehicle's speed, braking and direction without human help but it does allow a human operator to take over at any moment in scenarios where the car is unable to perform a task, for example merging into a different lane with heavy traffic.

¹⁵ Allen, Greg, Daniel Chan, Joseph S. Nye, Gautam Mukunda, Matthew Bunn, and John S. Park. *Artificial Intelligence and National Security*, 2017. Page 14 Figure 2.

¹⁶ Chesterman, Simon. "Artificial Intelligence and the Problem of Autonomy." SSRN, September 16, 2019. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3450540. Page 215, Driverless Cars and The Management of Risk

Level three is just an improvement of level two, but level four is where the human driver can be completely removed because no intervention is required, and a steering wheel is optional. Now that we understand the most important levels, we need to understand the laws surrounding these different levels in cases where an autopilot system loses control and/or is involved in a fatal incident. Current civil liabilities state that the currently most common levels zero, one and two still have the human driver as the sole responsible person since their attention and intervention is still required in certain cases¹⁷. At levels three and four the car manufacturer would have to assume responsibility for any actions taken and their consequences. Although, for the unmentioned levels five and six since we're assuming they would be completely driven through AI and no steering wheel and or human, it is still undetermined how responsible the AI would be. Companies have already come forward saying that with their completely autonomous cars in the future that the company themselves would take complete responsibility for their AI actions¹⁸.

Autonomy Concerns

Given that the curve of development of AI for public usage is trending upwards at a rapidly increasing pace in a yearly basis. It is no surprise that the future is closer than we may expect it to be although it is not all positive for the average person. For example, since we know that with the introduction of autonomy, car safety will increase since most crashes are due to human errors and without them behind the wheel crashes will happen a lot less¹⁹. Current laws in almost all cases require the operator to have their vehicle insured and whenever there were accidents,

¹⁷ Chesterman, Simon. "Artificial Intelligence and the Problem of Autonomy." SSRN, September 16, 2019. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3450540. Page 218, A. Civil Liability

¹⁸ Chesterman, Simon. "Artificial Intelligence and the Problem of Autonomy." SSRN, September 16, 2019. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3450540. Page 219, A. Civil Liability

¹⁹ Chesterman, Simon. "Artificial Intelligence and the Problem of Autonomy." SSRN, September 16, 2019. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3450540. Page 220, The Problem Of Autonomy

claims would be filed against each human party involved. Although, since responsibility will be removed from the consumers themselves to the companies, this will affect the vehicle manufacturers bottom-line therefore they would need to increase the price of vehicles. This is worth talking about since the entry to personal transportation for many individuals is already a tough scenario. This could have unforeseen affects since mobility is an important factor to what kinds of jobs an individual can get and how children in households grow up. Lastly, how should we program these vehicles to operate in conditions where it would even be tough for a human to decide. If we take the old tolly example, if we have three children crossing a street and a grandmother on the other side, if a vehicle were to lose control for whatever reason, to which side should the vehicle swerve. Even through just text this is a very tough question therefore who should code such actions and how should have such oversight.

Conclusion

The relationship between artificial intelligence and national security will continue to grow tighter each day that passes because national security threats continue to grow more complex and artificial intelligence usage continues to grow due to its benefits. It's been proven to already be a successful model therefore increasing that connection will only unlock more possibilities and create a safer nation for the United States and the world. We also need to keep in mind the unforeseen and unexpected affects some of these technological changes will have in our society on the long term rather than just baldly accepting every new technology as simply good, where should we draw a balance between the unexpected negative effects and the positive ones and who should make those decisions.