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ARTIFICIAL INTELLIGENCE: THE END OF CONFLICT

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ARTIFICIAL INTELLIGENCE: THE END OF CONFLICT

The future is widely misunderstood. Our forebears expected it to be pretty much like their present, which had been pretty much like their past.

- Ray Kurzweil, *The Singularity is Near: When Humans Transcend Biology*

INTRODUCTION

While many technological advances have both a positive and a negative side, thus far, technology in aggregate has indisputably improved the human condition, at least as measured by economic output.[1] As evidenced by the continued existence of civilization, historical technological developments have also not yet destroyed humanity, or rendered components of humanity irrelevant. This paper will argue that artificial intelligence and automation will initially lead to increased conflict, and then eventually to the end of conflict. First, automation will lead to a period of increased conflict within and between states driven as a result of significant numbers of people being rendered economically redundant and rising income inequality. Coincident with this increase in conflict, lethal autonomous weapon systems will become pervasive and dominant in war. This increase in conflict combined with reliance on artificial intelligence and autonomous weapon systems will result in the recognition of the superiority of artificial intelligence-driven autonomous weapon systems. The end result will be an arms race for a super artificial intelligence. A super artificial intelligence will be the final winner-take-all weapon system that will end human conflict.

[1] Angus Maddison, *The World Economy: Historical Statistics*, (OECD Development Centre, 2004), 262. This provides GDP per capita from 1-2001 AD, demonstrating growth from approximately 400 dollars (international Geary-Khamis dollars) to ~1,500 for Africa and ~27,900 for the United States.

AUTOMATION: A CATALYST FOR CONFLICT

> *Who will be man's successor? To which the answer is: We are ourselves creating our own successors. Man will become to the machine what the horse and the dog are to man; the conclusion being that machines are, or are becoming, animate.*
>
> - Samuel Butler, 1863 letter, *Darwin Among the Machines*

Automation is "the technique of making an apparatus, a process, or a system operate automatically,"[2] which is therefore an approach to removing human labour from a process. Automation has had a tremendous impact on the type and form of employment for people over time.[3] Thus far, "physical technology has on the whole been a complement to labor."[4] Even while a significant number of occupations have been eliminated by technology over time, average human wages have continued to increase because of technology's role as a complement to labour rather than a replacement of labour and the diffusion of the benefits of automation.[5] In the past, it was stated that "physical capital is more complementary to skilled than to unskilled labour,"[6] which is to say that unskilled positions faced a greater risk of elimination as a result of physical capital or automation. As a result of the automation of unskilled labour, it has been argued that low-skill service jobs have proliferated in the United States, "with relative

[2] Merriam Webster Dictionary, "Automation," accessed 24 May 2018, https://www.merriam-webster.com/dictionary/automation.

[3] David H. Autor, "Why Are There Still So Many Jobs? The History and Future of Workplace Automation," *Journal of Economic Perspectives* – Volume 29, Number 3 (Summer 2015): 7 and 10.

[4] Nick Bostrom, *Superintelligence: Paths, Dangers, Strategies*, (Oxford: Oxford University Press, 2014), 160.

[5] *Ibid*., 160.

[6] Michael Decker, Martin Fischer, and Ingrid Ott, "Service Robotics and Human Labor: A first technology assessment of substitution and cooperation," *Robotics and Autonomous Systems*, no. 87 (2016): 349. It should be noted that prior to the 20th Century the opposite effect was observed: Carl Benedikt Frey and Michael A. Osborne, "The Future of Employment: How susceptible are jobs to computerization?" *Oxford Martin School (*September 2013): 9.

employment declines in the middle of the [skill] distribution and relative gains at the tails."[7] At present, therefore, automation is increasing inequality by reducing the income earned by low-skill employees.[8]

While thus far automation has primarily affected unskilled labour, new research also indicates that heavily cognitive jobs are also at risk of automation, with about 47% of total US employment at risk of automation "within the next decade or two."[9] Automation, and artificial intelligence, is advancing beyond the replacement of routine non-cognitive and routine cognitive tasks to the replacement of non-routine non-cognitive and non-routine cognitive tasks.[10] It has been argued that the reduction in the value of even skilled employment has already commenced, and that when automation eliminates high-skilled employment, those high-skilled workers then displace lower-skilled workers further down the skill and value ladder.[11] Inequality has increased in both low-and middle income countries (those with a greater component of unskilled labour) and high-income countries (those with a greater component of skilled labour) from the early 1990s to the late 2000s.[12]

With tasks along the entire skill ladder at risk as a result of automation, it is essential to reexamine the premise that automation and technology will remain a complement to labour. As a result of transformations in the type of technology advances being made, it is no longer possible to look solely at the past impact of technology in order to predict the incremental impact of technology on the future. A parallel has been drawn to horses, where horses remained essential

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[7] David H. Autor and David Dorn, "The Growth of Low-Skill Service Jobs and the Polarization of the US Labor Market," *American Economic Review* (2013): 1555.

[8] David H. Autor, "Why Are There Still So Many Jobs? …," 5.

[9] Carl Benedikt Frey and Michael A. Osborne, "The Future of Employment…," 38.

[10] *Ibid*., 14-21. For a simple representation of the concept of artificial intelligence competitive in cognitive tasks, see Nick Bostrom, *Superintelligence: Paths, Dangers, Strategies…*, 11.

[11] *Ibid*., 13.

[12] United Nations Development Programme, *Humanity Divided: Confronting Inequality in Developing Countries* (UNDP: New York, 2013), 64.

to industry and society until perfect substitutes arrived (automobiles and tractors), at which point the equine population in the United States collapsed by more than 90% over four decades.[13] Advances in technology have reached the point where automation and artificial intelligence can provide perfect substitutes for human labour, and an extension of this analogy would lead "not merely [to] wage cuts, demotions, or the need for retraining, but starvation and death."[14]

The preceding paragraphs have identified three likely impacts of automation in the near future: an increase in poverty and inequality as a result of the decline in value of unskilled labour, an increase in poverty and inequality as a result of the reduction in value of components of skilled labour, and the potential absolute economic redundancy of the lowest-value components of the labour force. Income inequality, of course, "increases social discontent and fuels social unrest, [increasing] the probability of coups, revolutions, and mass violence."[15] Unsurprisingly, higher absolute poverty also increases political instability (civil wars, coups, and revolutions).[16] Given both the expected rise in inequality resulting from the next advances in automation, and the potential surge in economic redundancy and thereby poverty, absent any political action (discussed below) we would expect a significant increase in internal conflict within countries (essentially between classes).

In general, the potential solutions to the internal political instability caused by rising income inequality and economic obsolescence would be: pay-off of those affected, repression of those affected, or isolation of those affected. There is an abundance of advocates for a guaranteed minimum income or universal basic income (pay-off) solution in both academic

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[13] Nick Bostrom, *Superintelligence: Paths, Dangers, Strategies*, 161.
[14] *Ibid.*
[15] Alberto Alesina and Roberto Perotti, *Income distribution: political instability, and investment*, (Cambridge: National Bureau of Economic Research, 1993), 1.
[16] Richard A. Posner, "Equality, Wealth and Political Stability," *Journal of Law, Economics, & Organization*, Vol. 13, No. 2 (Oct., 1997): 344.

literature[17] and media.[18] In contrast, as a result of the politically unpopular nature of the concept of repression, one would not expect advocacy for this approach. However, states in the past have utilized repression to quell demands for a reduction in income inequality and poverty, and repression is positively correlated with economic need, or "the greater the scarcity is, the greater the repression," and with inequality.[19] Isolation, or placing barriers between those of different income levels, remains a solution advocated by many states and people, as evidenced by the prevalence of anti-immigration perspectives in both the United States[20] and Europe.[21] Both repression and isolation are approaches to income inequality and economic obsolescence that would likely lead to increased conflict.

In addition to automation having a destabilizing impact within countries, significant changes in the balance of powers between countries and status differences are causes of international conflict.[22] Currently, countries have a wide variety of labour exposure to different types of industry,[23] and as a result there are likely to be significant changes in power balances as a result of advances in automation producing uneven results across industry types, which could result in an increase in international conflict. Another reason for war is the indivisibility and

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[17] Harvey Stevens and Wayne Simpson, "Towards a National Universal Guaranteed Basic Income," (n.p. 2016). This provides a Canadian example. Miki Malul, John Gal, and Miriam Greenstein, "A Universal Basic Income: Theory and Practice in the Israeli Case," *Basic Income Studies: An International Journal of Basic Income Research*, Vol. 4, Issue 1 (April 2009). This provides an international example. The existence of an international journal of basic income research demonstrates the volume of academic research on this topic.

[18] Hugh Segal, "A universal basic income in Canada is more realistic than you think," *Maclean's*, 20 Apr 2018.

[19] Conway W. Henderson, "Conditions Affecting the Use of Political Repression," *The Journal of Conflict Resolution*, Vol. 35, No. 1 (Mar., 1991): 124-131. Unsurprisingly, repression should result from the problems predicted in this paper.

[20] Gallup, "Immigration," accessed 27 May 2018, http://news.gallup.com/poll/1660/immigration.aspx.

[21] Samuel Osborne, "Most Europeans want immigration ban from Muslim-majority countries, poll reveals," *The Independent*, accessed 27 May 2018, https://www.independent.co.uk/news/world/europe/most-europeans-want-muslim-ban-immigration-control-middle-east-countries-syria-iran-iraq-poll-a7567301.html.

[22] R.J. Rummel, *Understanding Conflict and War: War, Power, and Peace* (London: Sage Publications, 1979), Chapter 16.

[23] Central Intelligence Agency, data available in "The World Factbook," accessed 27 May 2018, https://www.cia.gov/library/publications/the-world-factbook/.

scarcity of physical resources.[24] As certain resources, such as rare-earth elements, are essential for modern technology and yet are geographically concentrated, this change in the allocation of necessary resources will also likely result in increased conflict; certain countries are already withholding these resources to improve their bargaining position in territorial disputes.[25]

Overall, therefore, automation and artificial intelligence are likely to result in increases in inequality within countries and between countries, the absolute economic redundancy of a portion of the populace, and an overall increase in conflict within countries and between countries. Absent political awareness and political solutions to these issues, automation and technology could transition from improving lives to instead significantly increasing poverty, conflict, and suffering.

LETHAL AUTONOMOUS WEAPON SYSTEMS: SUPERIOR KILLERS

As automation and artificial intelligence are increasing both intrastate and interstate conflict, advances in lethal autonomous weapons ("LAWS") will be simultaneously transforming the nature of conflict. The competitive nature of conflict, and the necessity of survival, have historically resulted in many advances in technology resulting from conflict, and considerable technology research being focused on conflict.[26] To the extent automation is a catalyst for a significant increase in conflict, this will instigate a broad competitive race in military technology.

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[24] Matthew O. Jackson and Massimo Morelli, "Reasons for Wars – an Updated Survey," in the *Handbook on the Political Economy of War* (Cheltenham: Elgar Publishing, 2009), 17-18.

[25] Graham Allison, *Destined for War: Can America and China Escape Thucydides's Trap?* (Houghton Mifflin Harcour Publishing Company: New York, 2017), 21.

[26] Brian Rappert, Brian Balmer, and John Stone, "Science, Technology and the Military: Priorities, Preoccupations and Possibilities," *The Handbook of Science and Technology Studies*, (MIT Press: London, 2008).

While autonomous weapon systems, those that have the capacity to "select and engage targets without further intervention by a human operator,"[27] are already in operation through weapon systems such as the Phalanx CIWS,[28] LAWS will also have the additional capacity to kill autonomously. This is an important distinction from existing autonomous weapon systems.

There are a number of facets to the prevalent argument that "lethal systems should not be autonomous."[29] First, it has been argued that LAWS will not be able to meet the dual tests under existing international humanitarian law of distinction and proportionality.[30] This is an argument that LAWS will never be able to meet obligations under existing law because it will be impossible to predict all situations that a LAWS may face, and therefore impossible to ensure compliance. Second, there is the moral argument that "it is simply wrong per se to take the human moral agent entirely out of the firing loop."[31] This is fundamentally an argument that killing is such a meaningful moral judgement that it should not be left to machines, regardless of the decision-making capacity of those machines. Third, it has been argued that there is a considerable safety risk to the employment of autonomous weapons, and that autonomous weapons "pose a novel risk of mass fratricide."[32] This argument could be limited to a single engagement, or to the broader concept of LAWS purposefully engaging in an entire conflict against the intention of the originator (the "Skynet" or "Terminator" concept). Finally, it has been argued that taking human beings out of harm's way will increase the probability of conflict

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[27] Kenneth Anderson and Matthew Waxman, "Law and ethics for autonomous weapon systems: why a ban won't work and how the laws of war can," (American University College of Law, Hoover Institution, and Stanford University, 2013): 1.

[28] *Ibid*., 1 and 5, and Andrew Tarantola, "Will we be able to control the killer robots of tomorrow?" *Engadget* (AOL Inc.: New York, 2017).

[29] Peter Asaro, "On banning autonomous weapon systems: human rights, automation, and the dehumanization of lethal decision-making," *International Review of the Red Cross*, Volume 94, Issue 886, (June 2012): 689.

[30] *Ibid*., 692.

[31] Kenneth Anderson and Matthew Waxman, "Law and ethics for autonomous weapon systems…," 15.

[32] Paul Scharre, *Autonomous Weapons and Operational Risk* (Center for New American Security: Washington, DC, 2016), 5.

by reducing the overall cost of conflict.[33] To a rationalist, this is a credible argument: for those who believe that the decision to go to war includes a calculation of the cost of the likely losses to be incurred,[34] then it is likely that the probability of conflict will increase as the estimated cost declines.

It is possible to assess the positive question of the probability that LAWS will become pervasive in conflict without addressing the validity of the preceding normative arguments in opposition to the utilization of LAWS. The adoption of transformation technology in the face of strong opposition requires two requirements: first, a strong advantage to the technology, and the second, a strong imperative for adoption.

There are already clearly advantages to LAWS. Machines are already superior to humans at a variety of military tasks given their advantages in decision making. This can be seen in situations where humans are already assisted by machines, where for example the complexity of flight is so high that there is already a significant degree of automation required for modern fighter aircraft.[35] This also applies to situations where machines already operate autonomously, such as through anti-missile systems, because humans "are too slow to deal with multiple, inbound, high-speed missiles."[36]

Flying provides an excellent example of a facet of warfare where machines are already superior, but LAWS are not yet pervasive. Machines have already developed the capacity to fly modern fighters without human intervention through machine learning.[37] With regards to combat

[33] Kenneth Anderson and Matthew Waxman, "Law and ethics for autonomous weapon systems…," 18.
[34] Matthew O. Jackson and Massimo Morelli, "Reasons for Wars…," 2.
[35] Kenneth Anderson and Matthew Waxman, "Law and ethics for autonomous weapon systems…," 4-5.
[36] *Ibid*., 5.
[37] Michael Byrnes, "Nightfall: Machine Autonomy in Air-to-Air Combat," *Air & Space Power Journal* (Maxwell AFB, May-June 2014): 58.

flying, machines are superior at all tasks.[38] Given the superiority of automated weapon systems with regards to reaction times, it may be possible for a single autonomous vehicle to wipe out an entire fleet of opposing aircraft.[39]

In general "[killer robots] outperform humans and human-controlled systems, especially in terms of speed, accuracy, and the ability to function without rest."[40] While semi-autonomous weapon systems that maintain a link to the operator are already in use and commonplace in contemporary warfare,[41] given jamming is a threat to weapon systems if there is a link required to a human operator, optimal systems will sever communication links and maintain full autonomy.[42] Finally, given the expectation that machines will have full human abilities within the next 30 years,[43] LAWS will have both superior reaction time and superior capacity for complex decision-making, making them the dominant weapon system in all operational respects.

The risk of failure in war (the extinguishment of one's existence), provides the greatest possible incentive to develop advanced technology. Artificial intelligence and robotics researchers published an open letter opposing autonomous weapons in concurrence with this point, stating that "if any major military power pushes ahead with AI weapon development, a global arms race is virtually inevitable."[44] While "neither the United States nor any other country is contemplating the development of any systems that would simply hunt down and kill or

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[38] *Ibid*., 57.
[39] *Ibid*., 58.
[40] Vincent Miller, "Autonomous Killer Robots Are Probably Good News," (ACT/Anatolia College: Thessaloniki, 2016): 4.
[41] Michael N. Schmitt, "Autonomous Weapon Systems and International Humanitarian Law: A Reply to Critics," *Harvard Law School National Security Journal* (2013): 5.
[42] Kenneth Anderson and Matthew Waxman, "Law and ethics for autonomous weapon systems…," 7.
[43] *Ibid*., 4.
[44] Future of Life Institute, "Autonomous Weapons: An Open Letter from AI & Robotics Researchers," accessed 24 May 2018, https://futureoflife.org/open-letter-autonomous-weapons-full-list/.

destroy enemy personnel and objects without [restrictions],"[45] that does not preclude such development when a country faces an existential crisis. In addition, to the extent "terrorists, dictators, [and warlords],"[46] begin utilizing LAWS, and there is no reason to expect they will constrain their behaviour, then advanced states will require LAWS to remain competitive with their opponents. As a result, it is reasonable to expect that the increase in conflict described in this paper's section on automation will be the catalyst for the widespread adoption and utilization of LAWS. While there are normative arguments advocating against utilizing LAWS, there are no compelling arguments as to why competitive participants in an existential conflict would choose not to adopt LAWS.

SUPER ARTIFICIAL INTELLIGENCE: THE END OF CONFLICT

> *Let an ultraintelligent machine be defined as a machine that can far surpass all the intellectual activities of any man however clever. Since the design of machines is one of these intellectual activities, an ultraintelligent machine could design even better machines; there would then unquestionably be an "intelligence explosion," and the intelligence of man would be left far behind. Thus, the first ultraintelligent machine is the last invention that man need ever make, provided that the machine is docile enough to tell us how to keep it under control.*
>
> - John Irving Good, *Speculations Concerning the First Ultraintelligent Machine*

The widespread adoption and pervasive utilization of LAWS in conflict will demonstrate the superiority of artificial intelligence in war. This prompts the question: what is the logical conclusion to the development of artificial intelligence in conflict? The answer is the

[45] Michael N. Schmitt, "Autonomous Weapon Systems and International Humanitarian Law…," 6.
[46] Future of Life Institute, "Autonomous Weapons…"

development of a superintelligence or super artificial intelligence ("SAI"), what Good first called an "ultraintelligent machine."[47]

An SAI refers to "an intellect that greatly outperform[s] the best current human minds across many very general cognitive domains."[48] In order to develop an SAI, one must first develop a general artificial intelligence ("GAI") that is equivalent to that of a human,[49] a component of the predicted technology explosion referred to as the Singularity.[50] Currently, artificial intelligence is vastly superior in a wide variety of functions, including those in competition with humans,[51] but we have not yet achieved a GAI comparable to that of humans. As of 2014, a combined sampling of research institutes forecast there to be a 10% probability of development of GAI equivalent to that of a human by 2022, a 50% probability of this occurring by 2040, and a 90% probability of this occurring by 2075.[52] In contrast, Kurzweil argued in 2004 that this would be achieved by the late 2020s,[53] while IBM intends to complete this itself by the early 2020s,[54] and a recent poll of AI researches estimated this would occur by 2055.[55] Following the development of a GAI comparable to that of humans, the timeline for a transition to SAI varies from Kurzweil's perspective that this will occur more than ten years after the

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[47] John Irving Good, "Speculations Concerning the First Ultraintelligent Machine," *Advances in Computers* 66 (1965): n.p.

[48] Nick Bostrom. *Superintelligence: Paths, Dangers, Strategies,* 52.

[49] *Ibid*., 61.

[50] Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology*, (The Penguin Group: New York, 2005), 7.

[51] Nick Bostrom. *Superintelligence: Paths, Dangers, Strategies*, 11-13. Artificial intelligence at this time possessed superhuman capacities in checkers, backgammon, Othello, chess, scrabble, Jeopardy!, and FreeCell. At only four years old, this reference is now out of date, and artificial intelligence now also has superhuman capacity in the game Go, for example.

[52] *Ibid*., 19.

[53] Ray Kurzweil, *The Singularity Is Near…*, 25. Page 200 then discusses the concept of uploading a unique human into software at around the same time (2030s).

[54] James Barat, *Our Final Invention: Artificial Intelligence and the End of the Human Era*, (Thomas Dunne Books: New York, 2013), 61.

[55] Max Tegmark, *Life 3.0 – Being Human in the Age of Artificial Intelligence* (Penguin Random House: New York, 2017), Kindle location 783.

development of general artificial intelligence (therefore in the 2040s on his timeline),[56] to Bostrom's argument for a fast (minutes, hours, or days) to moderate takeoff,[57] to Barat's prediction of a potential SAI by 2030.[58] What does not appear to be in dispute, however, is that a GAI comparable in capacity to a human will be developed, and that an SAI will logically proceed from the development of this GAI.

Nearly every discussion of SAI integrates a parable or story to convince its readers of the inevitable superiority of SAI: Barat uses the Busy Child parable,[59] Tegmark uses the Omega Team parable,[60] Bostrom uses the less direct Unfinished Fable of the Sparrows,[61] and Isaac Asimov wrote "The Last Question."[62] The majority of these stories clearly state that SAI will dominate the world and provide one of many potential paths to dominance. In discussing competition in the development of SAI, Bostrom states,

> [the leading project would have] a decisive strategic advantage and the opportunity to parlay its lead into permanent control by disabling the competing projects and establishing a singleton.[63]

A singleton is "some form of agency that can solve all major global coordination problems,"[64] or, alternatively, any agency that can achieve unassailable dominance. Bostrom describes the stages of an SAI takeover to become a singleton as: first, the pre-criticality phase, where a seed

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[56] Ray Kurzweil, *The Singularity Is Near…*, 262.
[57] Nick Bostrom. *Superintelligence: Paths, Dangers, Strategies* (Oxford University Press: Oxford, 2014), 63.
[58] James Barat, *Our Final Invention…,* 69.
[59] *Ibid*., 7-16.
[60] Max Tegmark, *Life 3.0 – Being Human…*, Kindle location 119-428.
[61] Nick Bostrom. *Superintelligence: Paths, Dangers, Strategies*, The Unfinished Fable of the Sparrows.
[62] Isaac Asimov, "The Last Question," *Science Fiction Quarterly* (Columbia Publications, November 1956).
[63] Nick Bostrom. *Superintelligence: Paths, Dangers, Strategies,* 82.
[64] *Ibid*., 82.

AI with the capacity to improve its own intelligence is developed; second, the recursive self-improvement phase where the AI improves at improving itself; third, the cover preparation phase where the SAI plans its dominance; and fourth, the overt implementation phase where SAI eliminates any potential opponents to its plan (through advanced biological weapons, for example).[65] Once a singleton has been developed, it is unclear, and strongly debated, whether that singleton can be regulated and controlled by the developer, or will simply destroy humanity as a result of the nature of SAI or a programming flaw.[66] As any essentially omniscient singleton will likely ruthlessly and immediately destroy all potential for opposition, there will be no further room for conflict, even if an SAI does not simply eliminate humanity in a single strike.

As it is clear that the first developer of an SAI will dominate, or that the SAI itself will dominate, development of an SAI is a winner-take-all game.[67] While in theory it could be possible for cooperation to prevent the game from being played, "the competitive advantage [… of advances in] automation is so compelling that passing laws [to prevent them] merely assures that someone else will."[68] Kurzweil uses the term "relinquishment" to describe the concept of halting technological advance in order to prevent Singularity and SAI, but he describes relinquishment as impossible, saying, "It wouldn't work, [but] would just drive the technologies underground where irresponsible practitioners would then have no limitations."[69] It is expected that governments will dedicate considerable resources to monitoring potential SAI projects as

[65] *Ibid*., 95-97.
[66] James Barat, *Our Final Invention…*, 100, 122 and 132-146. These provide examples of the potential negative outcome, whereas 55-58 describes the concept of "Friendly AI."
[67] *Ibid*., 122. The alternative term utilized here is a "winner won't take all" game, as the argument of Barat is that SAI is more likely to destroy humanity.
[68] *Ibid*., 118.
[69] *Ibid*., 151.

they come closer to fruition, and attempt to acquire advanced projects, or destroy foreign projects if necessary.[70]

This discussion must also be considered within the context of the global situation at the point where the development of SAI is recognized as imminent. This paper has argued that the global situation at that time will be one of increased intrastate and interstate conflict and an arms-race in LAWS. Such an environment is not one that would be conducive to a world government cooperating to regulate or prevent SAI, but rather one of incredible existential competition where there is constant fear and suspicion of others' weapons development programs. This is exactly the environment that would lower the probability of cooperation.[71] At that point in time, even if a state or organization had no interest in dominating the globe through development of a singleton, that state or organization would have no option but to pursue development and then activation of a singleton out of the motive for self-preservation.

CONCLUSION

> *Whoever controls [SAI] controls the world.*
>
> - James Barat, *Our Final Invention: Artificial Intelligence and the End of the Human Era*

Humanity is rapidly rushing along the path to the end of conflict. Along that path, humanity will face the challenge of the distribution of the gains from automation, and the economic redundancy of significant swathes of the population. While struggling with this inequality and economic redundancy, and the conflicts that result, the competitive nature of war

[70] Nick Bostrom. *Superintelligence: Paths, Dangers, Strategies,* 83.
[71] *Ibid*., 86.

will drive an arms race in LAWS and their pervasive, dominant employment. Recognizing the advantages of AI, and the winner-take-all nature of an SAI, governments and private organizations will turn their focus to SAI development. And when any government, organization, or individual has an SAI, they will be forced to turn it on, lest an opponent turn their SAI on first. Development of an SAI may represent humanity's greatest and final prisoner's dilemma: cooperation would save humanity, but there is no way to ensure the cooperation of every potential opponent. And so some component of humanity will deploy an SAI, and whether this SAI is benevolent or malicious, it will bring an end to conflict. The form of that end to conflict, however, is wildly uncertain.

> *The consciousness of [the SAI] encompassed [the Universe…]. And [the SAI] said: "LET THERE BE LIGHT!" And there was light.*
>
> \- Isaac Asimov, *The Last Question*

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