



ARTIFICIAL INTELLIGENCE: A NEW ERA OF WARFARE

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Unlike any other technology in modern history, artificial intelligence (AI) is poised to reshape the character of warfare. As with electricity in the 20th century, AI possesses the ability to animate everyday products and communications, enabling everything from vehicles to cameras to weapons systems with the ability to interact with the world around them, and with each other. What's more, AI allows seemingly mundane items to not only actively assess their environment, but also to learn from it and make adaptations and improvements on the fly. These developments are both exceptionally novel and groundbreaking in terms of potential impact; however, they also represent only the beginning of AI's broader strategic applications. In no uncertain terms, AI will revolutionize the core dynamics of warfare and will, in the long term, represent a true revolution in every aspect of human affairs.

Historically speaking, the concept of AI is nothing new. As renowned venture capitalist and AI expert Kai-Fu Lee has explained, the term "artificial intelligence" was originally coined in 1956, and there have been numerous ebbs and flows in AI development in the time since. What's most changed in the past decade and has, in fact, acted as the primary catalyst for meaningful inroads towards truly autonomous AI, is the vast amount of data being produced every day and the immense computing power available to companies and governments all over the world. Given the enormity of the data environment of today, it's nearly mind boggling when one considers that in the history of the world, 90 percent of the data has been produced in the last two years. That data is the "fuel" for machine learning – which in turn informs AI – this has profound implications for the art of warfare and the nature of strategic dominance.

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In the past, the most absolute symbol of US military superiority was its "strategic triad," or, the three legs of its strategic nuclear deterrence consisting of missile squadrons, bomber fleets, and ballistic missile submarines. In this new AI-defined age, sometimes called the cognitive age, there must be a reconsideration of this triad to instead focus on AI, big data analytics, and super-computing. The synergy of these three represents the core ability to remain competitive in an era of great power conflict defined by predictive analytics and new forms of warfare never before seen over the course of human history.

For those who have studied the great military theorist Carl von Clausewitz, conversations about the unchanging nature of war and the ever-changing character of war are nothing new. Within this context, it is my belief that AI will lead to a new era of warfare in which the speed of decision-making and action will be significantly faster than anything we've seen before. I've studied and written extensively about this effect of AI on the evolving character of war toward a concept I've called hyperwar, and it goes far beyond the extensive networking of platforms in a battlespace – for that technology has existed for decades. Instead, the human will be removed from the process of analyzing the environment entirely, leading to more accurate, more comprehensive, and importantly, much faster assessments and response times. This reality also results in less direct control by human combatants and raises profound questions about a potential evolution of the nature of war.

This topic lends itself to discussions about "killer robots," or at the very least the impending use of AI in lethal autonomous weaponry. While those discussions are relevant and inextricably linked, they represent a narrow understanding of the greater issues at hand and the broader applications of AI within warfare. Indeed, the concern over AI's potential or theoretical military appli-

cations must not distract us from how far-reaching the impact of AI will be in nearly all domains of armed conflict. Terminator-style weapons platforms may be a long way off, but the core technologies that make them so lethal are not, and drone technology is the best example of this today.

Despite its comprehensive use of drone technology, the US, to this day, requires a human in the loop for every system it deploys. This is an important moral point driven by American values and international norms, and an intentional limiting factor for the types of technologies the US can utilize. For another nation or entity without this moral constraint, imagine a swarm of small drones – no human in the loop – with the targeting data and reliable image/facial recognition, to search and destroy a specific target, pre-coded into their algorithms. Furthermore, the drones are networked, and through AI, able to adapt to countermeasures and work together to creatively pursue multiple trajectories to fulfill their objective(s). Now consider that same technology let loose upon a military base or on a major sporting event or city.

The community of Western nations that defined the post-World War II order will never pursue such malign tactics. Yet, the necessity to defend against such technology is growing by the day and the wisest among us will seek to find ways to utilize it themselves for the safety of their people. The US and its partners are already spending a great deal of time on this issue, but I'm afraid that even with those collective efforts, the speed of government will simply not keep pace with the speed of innovation and integration of these new and emerging technologies. Illiberal and authoritarian governments will not be so constrained – be it morally, ethically, or even legally – to place values



and principles inside the automated “kill chain,” and in an environment that already favors the attacker or aggressor, this will be to their overwhelming benefit.

This example of drone swarms is only a sliver of the many challenges now emerging in AI driven warfare, but it highlights the way these technologies will also bring with them a bewildering array of implications, to include major ethical, legal, and societal questions with which the global community of liberal democracies will need to grapple if society is to fully embrace this new reality. For nations governed by a commitment to human

rights and the rule of law within a global rules-based system, this will be an enormous challenge. It is in no uncertain terms a constraint in this new operating environment, but one we must gladly bear in the face of foes who would see Western society crumble using any tactical or strategic advantage, no matter how awful the cost. This will be the defining issue not just of 2019, but the entire 21st century, and the principled, values-based community of nations must come together to be on the right side of history on this important global challenge.