The Hague Centre
for Strategic Studies

The Realities of Algorithmic Warfare

Some Thoughts on the Impact of Military Artificial Intelligence Applications

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Remarks

Artificial Intelligence – or AI – applications are affecting the character of war and international security more broadly in a variety of ways. Before we turn to the impact of these military AI applications, allow me to lay out some more general thoughts first on how to think about their impact:

Typically, people assign the term AI to applications that are novel and solve problems previously associated with human intelligence, bestowing it with a magical aura. However, when that application becomes mainstream the AI label is often removed.

AI applications are affecting the character of war, not (yet) through Battalions of Anthropomorphic Terminators but through the integration of AI in existing applications along the entire OODA loop.

Our human history of war features a long succession of new technologies that have affected how wars were fought. From the rifle to the radar, from the sword to the submarine, and from the telegraph to the tomahawk: each time that new technologies appeared they inspired utopian but certainly also dystopian views of how that particular technology or weapon system would dramatically affect the character of war. Our history proves instructive: following the Wright brothers' first flight in 1903, science fiction writers and military strategists alike stumbled over one another to proclaim the coming of the era of air war. More recently, following the emergence of cyberspace, discussions have centered on whether future war will be cyber war with observers warning for the risks associated with a cyber Pearl Harbour. At present, scholars, professionals, and laymen are engaged in heated debates about the impact of AI on future war, which the REAIM Conference is of course testament to. And again, the debate traces a similar pattern with justified concerns alternating with much hyperbole and powerful and scary images of future war being autonomously waged by machines rather than by men.

What is different this time around is the fact that there is not "one AI system." Instead, there is a vast range of algorithmic applications that together represent an all-purpose technology, an all-purpose technology that affects the character of war across its many dimensions and throughout the entire OODA loop, which is military speak for observe-orient-decide-and act. This technology is relevant both on and off the battlefield, and in times of war as well as peace.

Military history also that real changes to the character of war tend to be incremental rather than punctuated, and evolutionary rather than revolutionary. Change comes about not through some new silver bullet or –pun intended– killer application, but from painstaking work in which military organisations develop and refine warfighting concepts to embed technologies in new modi operandi while they adapt their organisational structures accordingly.

Now, with that in mind, we can turn to the question of how AI is changing the character of war. Some observers are underwhelmed with the degree of change. They compare dystopian visions of barracks filled with robot soldiers to the equally dystopian reality of the bloody trenches filled with human corpora in the current Russia-Ukraine War, and they find – with ample reason – that war continues to be "To *ánthrōpos*, or that "human thing".

Although war will continue to be a human affair, at least for the foreseeable future, it is clear that breakthroughs in ANI or Artificial Narrow Intelligence, in combination with the explosion in computing power, have yielded a vast range of algorithmic applications that defence organisations exploit when waging war. And that, Ladies and Gentlemen, is not some dystopian reality tucked away in the distant future; rather it is part and parcel of the realities of algorithmic warfare taking place in the here and now. As such, AI applications are affecting the character of war in a variety of ways, not (yet) through Battalions of Anthropomorphic Terminators but through the integration of AI in existing applications along the entire OODA loop.

On the battlefield, this is already generating significant changes that are increasing armed forces' battlefield effectiveness, through better situational awareness and understanding, and shortening decision-making cycles through decentralised command networks with compressed kill chains in so-called battle clouds.

The acceleration of conflict is generating a strategic rationale for further integrating algorithms along the OODA loop and marks the advent of centaur teams, with humans still in the loop but in near seamless integration with AI applications. Algorithmic analysis of Sigint also increases battlefield transparency – there is nowhere to hide! – and requires armed forces to conduct dispersed operations in contested and cluttered environments. Algorithms are also used in the navigation of unmanned aircraft and target acquisition, both offensive (through loitering munitions) and defensive (integrated air and missile defense).

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However, their application is not just limited to the battlefield and has, notably, considerable implications for nuclear stability. For starters, radical transparency will change the tenets underlying nuclear deterrence in various ways. For example, the exposure of launch system locations as well as the greater accuracy and maneuverability of delivery vehicles will affect deterrence dynamics and potentially engender new first-and second-strike instabilities. Moreover, the uncertainty associated with technological change is breeding incentives for larger nuclear arsenals and the adoption of more flexible nuclear command and control postures – developments that are currently already in play.

Algorithms are also unlocking new realms in which conflict actors seek to exert influence, including through what my colleague Frank Hoffman calls "cognitive warfare". There are now battle-tested playbooks, off-the-shelf scripts, and Cambridge Analytica-like services for hire. Again, this will not only affect the tactical but also the strategic level of war. Imagine what a Deep Fake of Vladimir Putin announcing the launch of nuclear weapons will do to strategic stability, and even if properly managed, what societal upheaval it will create. It is important to note that we are only at the dawn of the Information Age: 5G, the advent of AR (Augmented Reality) and VR (Virtual Reality) and the emergence of the Metaverse will open reams of new opportunities for conflict actors to create havoc.

In sum, the impact of AI on the character of war and international stability is here, it is real, and can be expected to progressively materialise in the years to come.

This has catalysed transformations in both ethical and legal domains and presents an important multi-layered challenge for how to limit and regulate the production, proliferation, and use of such technologies. I have touched on these implications in previous publications and look forward to elaborate on them in the Q&A.

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