Nuclear Deterrence and the Significance of AI

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Deterrence theories are essentially a composite of cognitive science and politico-military strategy. Artificial Intelligence (AI) elevates assumptions about cognitive behavior relative to the importance of warfighting. Mastering nuclear deterrence now requires policymakers and their military advisors to move beyond prior assumptions that deterrence stability rests on assured destruction or other measures of comparative damage between combatants.

States now attach equal or greater significance to capabilities for agile decision-making, strategic deception, crisis management, and information dominance. States' relative performances in applying AI for these purposes will determine who prevails in nuclear bargaining, crisis stability, escalation control, and, if necessary, war termination. In its early days, AI was a subjective and philosophical excursion into "what if" possibilities, anticipating a slow process of technological development and eventual change.

The turn of the twenty-first century saw technological innovation in information, and its application to military and security issues, accelerate. The rise of information technology firms in the private sector created unprecedented demand for new consumer products and opened the door to innovation in information-driven weapons.

In the not-too-distant future, Americans can expect the human–machine interface to be redefined by more ambitious and self-aware AI "machines" that learn faster and more accurately. At a certain point of "singularity," AI apprentices will challenge their masters for supremacy in speed, accuracy, and recall. The question then becomes, what can AI be trusted to do or not do, in exigent circumstances of crisis management and war?

The first challenge for military leaders and policymakers is to hold the high ground of ethical guardrails for limiting the applications of AI to deterrence and warfare. Accountable political leaders can never delegate war decisions to a machine; however intelligent it may be.

The evolution of AI from a "machine" to a human simulacrum will create temptations to buck-pass to seemingly "objective" decision aids, undistracted by subjective human feelings or errors. But war, from the evidence of history as understood by its master strategists, is the most political, holistic, and unpredictable of human activities. Wars are societal, cultural, and civilizational in their motivational contexts and in their ultimate impacts. The illusion that war can be controlled strictly by machines will dissolve in the initial stages of any major conflict.

What do the preceding observations mean for nuclear deterrence and the possible impacts of AI on nuclear strategy? First, the detect, decide, and direct process is likely to accelerate. Future attacks will proceed at a faster pace as smart weapons challenge defenses that are easily overwhelmed.

Second, new methods and systems for nuclear command, control, and communications (NC3), as well as battle management, and command and control (BMC2) will be necessary, and these advanced BMC2 suites will be heavily dependent on advances in artificial intelligence. Third, the US will have to revisit the existing protocols for authorization of nuclear use. AI may serve as a useful decision aid by generating additional options for those in the political and military chain of command. If the worst happens and deterrence fails, AI assistants may generate pre-selected or alternative choices for managing escalation control and war termination.

Within this context, it is also important to remember recent American history and how scientists and politicians coped with the arrival of the nuclear age. Many doomsayers in the early years of the Cold War prophesied that the availability of atomic and then thermonuclear weapons would inevitably lead to World War III and the extinction of mankind. Some experts and political leaders anticipated a world of twenty or more nuclear weapons states before the end of the twentieth century.

Against this pessimism, the American political system evolved institutional controls over the production and use of atomic energy. It also developed policies that ensured civilian control over the development and deployment of nuclear forces. American strategic and non-strategic nuclear delivery systems and their associated weapons were designed to perform reliably for duly authorized commands. However, these commands must also resist potential false positives in warning and attack assessment, deepfake orders of direction, or other misjudgments that could lead to mistaken use.

As for pessimistic expectations about the spread of nuclear weapons, nonproliferation has succeeded well beyond the forecasts of many experts. However, complacency is not warranted. The possibility of nuclear weapons spreading in Asia or in the Middle East casts a shadow over nuclear optimism and argues for continuing international vigilance. There is also the concern that larger nuclear arsenals in the hands of autocratic regimes pose a continuing threat to peace and stability favored by democratic political systems. Pairing such arsenals with AI-enabled NC3 and BMC2 systems poses real concern.

The alignment of China, Russia, Iran, and North Korea is concerning for many reasons, including their predictable interest in AI as a competitive advantage in effectuating command and control of their respective NC3 systems. While the first eight decades of the nuclear era proved manageable, artificial intelligence may challenge the positive record of nuclear deterrence, particularly as China and Russia aggressively incorporate the capability into their command-and-control systems.

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