

## **SIMULATING EPIDEMICS: WHY THE MODELS FAILED US**

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### **ABSTRACT**

The U.S. is returning to a state of great power competition. The U.S. military must once again contend with near-peer adversaries that can bring to bear advanced weapon systems that are used in coordination with diplomatic, information, military, and economic (DIME) instruments of national power. In response to these challenges, the U.S. military is turning to new concepts of warfare such as Multi-Domain Operations (MDO) and Joint All-Domain Command and Control (JADC2). These concepts seek to orchestrate capabilities more tightly across domains (land, air, maritime, space, and cyberspace) as a means to converge effects rapidly and dynamically. This approach to warfare can provide U.S. commanders with a greater variety of options while presenting an adversary with multiple simultaneous dilemmas; however, it can also present U.S. commanders and their staffs with a far more complex battlespace and much shorter planning and decision timelines than they have faced in the past. The U.S. Department of Defense is looking to artificial intelligence (AI) and machine learning (ML) as potential technologies to support the execution of MDO and JADC2. AI and ML are often combined with models and simulations (M&S) to provide enhanced capabilities. This talk will present different configurations that combine AI/ML with M&S and discuss their potential military applications. It will conclude with a presentation of a prototype course of action (COA) analysis tool that has been developed for the Army, including the specific way this tool combines AI with M&S and future work that will enable it to better support MDO and JADC2.

### **AUTHOR BIOGRAPHY**

**ERIC WINSBERG** is professor of Philosophy at the University of South Florida. He is author of *Science in the Age of Computer Simulation* and *Philosophy and Climate Science*.