Ushering in AI/ML Systems Requires a Virtuous Cycle

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It seems almost every discussion touching on the future of warfighting holds promise for artificial intelligence and machine learning (AI/ML) fundamentally changing the nature of warfare.

This should not be a surprise, as information has always been the key ingredient to success in warfighting. For time immemorial, however, accurate information has been difficult to obtain. Success in combat, the theory goes, comes to those with an ability to sort through incomplete information, assess what was probable and what was unlikely, and then decide, ostensibly based on professional judgment honed by experience, inside the decision cycle of the adversary.

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As the world digitally transforms at a dizzying pace, data has become digital information and a proliferation of sources and sensors of data have been matched with incredible advances in data processing speed and scale. As a result, the amount of information to consider has overwhelmed even the most wise and seasoned decision makers.

This reality of a digitally transformed world serves to further reinforce the shift in importance from availability of information to speed of decision making. Fortunately, the development of AI/ML enabled systems can enhance human decision making — assisting humans in a way that, despite the deluge of data and information, can lead to timely, accurate, effective and, perhaps most importantly, trusted and ethically sound decisions.

Overcoming "Information Overload"

Before we can realistically consider that AI/ML will allow us to overcome the challenge of "information overload" and turn it into an opportunity to accomplish the mission efficiently and effectively, it's important to realize there are significant concerns to be addressed first.

The preponderance of challenges associated with operationalizing AI/ML systems center on trust and ethics. Users must trust that AI will be an effective partner, enabling them to do their jobs more quickly and effectively, rather than displacing them. System owners must

trust that AI will be secure without introducing new vulnerabilities or putting their most crucial activities at risk. The public must trust that AI will treat them fairly and behave responsibly, behaving ethically and safely.

The importance users, system owners and the public place on trusted AI/ML enhanced and enabled systems puts the onus on developers of these systems to do so in a disciplined, science-based approach.

In addition to considering any unique end user requirements for data privacy, security, and assurance, in the technologies they develop, they must also adhere to a methodology of continuous development and to a foundation of governance, if they are to ensure AI/ML systems that are themselves, secure, reliable, resilient, and ethical.

What's called for is a scalable and iterative approach that continually builds toward trusted AI, and that is only possible when equal consideration and attention are given to both the technology and a methodology that incorporates human feedback and improvements as they occur in the field.

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Balance Risk and Reward

Contemporary discussion on ethical AI/ML is skewed to the point of being one-sided. Naysayers and alarmists highlight the potential dangers associated with AI, pointing out a myriad of possible mistakes and miscalculations that could lead to dire consequences, including unnecessary damage or unwarranted deaths.

This argument, however, fails to consider the human failings and failures that form the baseline in warfighting today, where tragic consequences result from human error. When looked at this way, AI/ML enabled systems may help humans be more virtuous in their warfighting, helping to achieve more ethically aligned actions and decisions, than perhaps possible if made by humans alone.

An approach to AI/ML enablement should reflect greater balance between these opposite views, away from AI/ML as only a risk and toward consideration of the possibility of more ethical outcomes. This will require an approach grounded in the perspectives and shared values of multiple stakeholders, as seen through the lens of the aforementioned end users, system owners and the public who, for example, want assurance there is no implicit bias or unfairness in the way AI/ML enhanced systems behave and decide.

There are many other considerations and much work to be done before we might begin to leverage AI/ML enabled warfighting systems at scale before these solutions will be trusted to the point machines will interact with humans and assist them naturally as a teammate.

As humans develop organic trust in AI, they will also begin to better understand any associated strengths and weaknesses. And for humans to trust as they would a teammate, the AI must consistently behave in an ethical manner — a virtuous cycle indeed. ■

About The Author

Lt. General Bender (retired) most recently served as CIO for the Air Force, where he was responsible for 50,000 cyber operations and support personnel across the globe with oversight for the USAF's IT investment strategy and a portfolio valued at $17 billion. After retiring from the Air Force following a 34-year career there, Lt. General Bender joined Leidos in September 2017. Now tasked with overseeing and managing the Strategic Account Executives, a group of customer-facing senior-level former government officials, Lt. General Bender aims to bolster customer relationships and advance strategic initiatives to foster organic growth.