



The **AI** Imperative

Artificial intelligence will strengthen our national defense capabilities, but it must be implemented with care.

The United States has found itself in a “Sputnik moment for modernizing our military,” according to some **national security officials**¹. Like the period following the Soviet Union’s satellite demonstration in 1957, we are again in a technological arms race with formidable rivals. Many top defense officials believe China is poised to lead the future of warfare through its open and aggressive pursuit of artificial intelligence (AI), which many consider a linchpin of high-tech conflict in the years ahead. China has devised plans and dedicated enormous resources to meet its **stated goal**² of surpassing the U.S. in AI by 2030. Although Russia lags behind, it has also expressed its intentions to be a player in this race.

1. The Chinese threat that an aircraft carrier can't stop (https://www.washingtonpost.com/opinions/the-chinese-threat-that-an-aircraft-carrier-cant-stop/2018/08/07/0d3426d4-9a58-11e8-b60b-1c897f17e185_story.html?utm_term=.7dc16be5d165)
2. China's application of AI should be a Sputnik moment for the U.S. But will it be? (https://www.washingtonpost.com/opinions/chinas-application-of-ai-should-be-a-sputnik-moment-for-the-us-but-will-it-be/2018/11/06/69132de4-e204-11e8-b759-3d88a5ce9e19_story.html?utm_term=.9ece38cafcb3)

How should the U.S. respond? Like aerospace engineering after Sputnik, AI has become one of the top emerging technologies that the federal government is eager to understand and use. However, AI adoption in the national security sector has come under scrutiny by some in the tech industry. A debate is unfolding about whether or not AI should be deployed as an instrument of warfare.

A rift between the tech industry and the Pentagon is a significant problem. To maintain its leadership position, the U.S. military must source the best and most advanced technologies available. Some will be developed by the Defense department, but many will come from the private sector and require integration into the department's complex IT systems. AI tools are customized for specific tasks all the time, but the commercial industry that creates them often lacks the expertise to integrate AI into national security systems, which often require greater care and more rigorous testing than commercial systems. Leidos, one of the largest IT systems integrators for the federal government, will play an important role in these efforts.

AI is an important field in modernizing the U.S. military, and keeping it from those who protect us would come with serious consequences. New technology always comes with risk, but it's our responsibility to act wisely. America's geopolitical adversaries aren't holding back, with coordinated efforts among government, academia and private industry. To effectively respond to this "Sputnik moment," the U.S. must do the same.

To illustrate the point, we've selected three cases that demonstrate practical AI adoption in national security. In combat teaming, AI helps soldiers make better and faster decisions. In geospatial intelligence, AI accelerates the analysis of overhead imagery. And, in counterterrorism, AI extracts actionable intelligence from seized media. AI adoption in the armed forces is more than just hype. We believe these specific applications add substance to the broader conversation about AI in national security.

what is **AI**?

Artificial intelligence (AI) is the simulation of human intelligence by computers. AI can refer to machines that exhibit human traits such as logical thinking, intuitive leaps and emotional intelligence. AI can also refer to autonomous systems that perceive their environment and take actions that maximize their chance of success. This is done by mimicking the human brain's ability to reason over various types of data. AI is now a major source of military strategy because of its power to gain valuable insights from data.

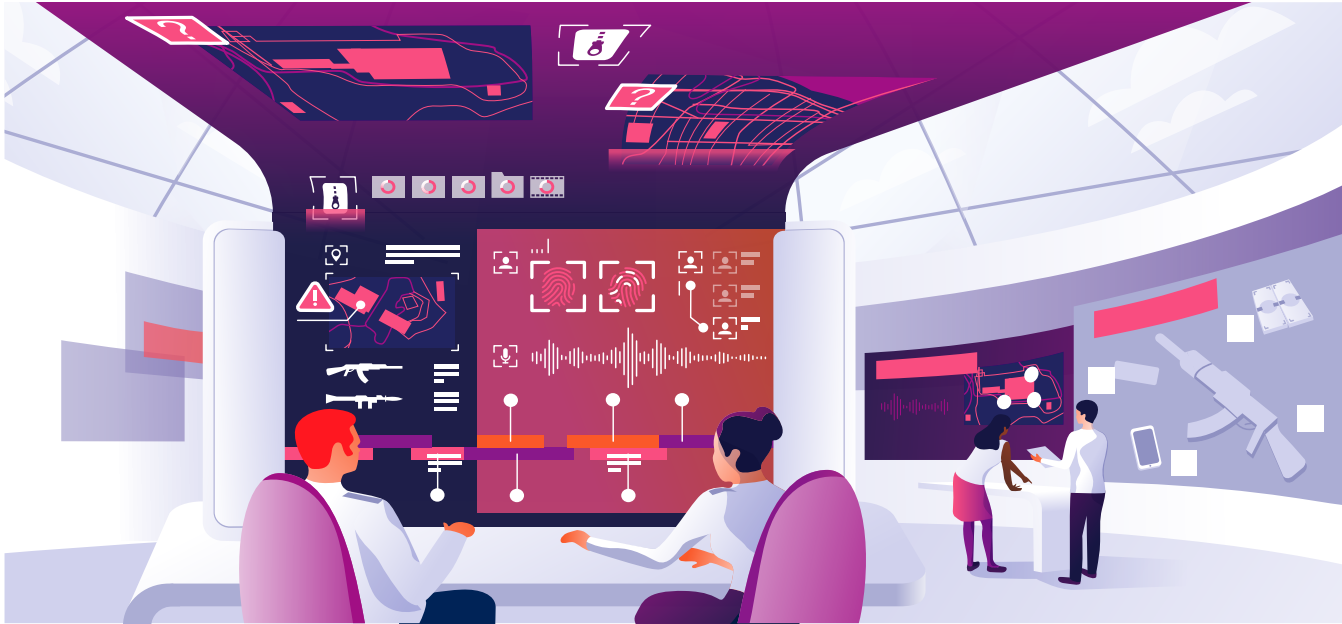
AI and Combat Teaming



The OODA Loop is a decision-making model that stands for observe, orient, decide and act. Though first articulated as a strategy to dominate air-to-air combat in the twentieth century, the OODA Loop was later adopted in other combat operations and even extended into the business world. It became famous for precisely outlining how to win in adversarial environments.

AI is poised to improve military decision-making by accelerating progression through the OODA Loop. Decision-making in the U.S. military is often dictated by documented processes. By embedding AI into these processes, decision-makers will be able to act much faster. AI can help observe by processing mission-related data. AI can help orient by adding meaning to these observations and making sense of the data. Human control must be retained, however, to decide and act in combat settings. U.S. military doctrine assures human accountability behind any decision to pull a trigger. Safeguards should remain in order to prevent decision-makers from relegating life-or-death decisions to machines or abdicating responsibility for those decisions.

AI and Geospatial Intelligence



AI is transforming overhead vigilance, a tradecraft known as geospatial intelligence (GEOINT). The world is flooded with raw data collected by satellites, drones and other aircraft deployed around the globe. AI holds enormous power to turn these chaotic data sets into coherence. AI can not only analyze specific images faster, but also identify patterns across a wide range of assets to detect patterns. Applying AI to GEOINT will help decision-makers better understand what is happening on the ground and predict what will happen next, including during relief operations the U.S. military and its allies perform all over the world.

As part of an R&D program, Leidos data scientists developed AI-powered computer vision algorithms to identify man-made structures in overhead imagery across Rio de Janeiro, which covers roughly 500 square miles. The team estimated it would take an individual analyst roughly 44 weeks to identify and categorize these structures across the entire city. But the automated solution was so advanced it learned to identify them on its own, reducing analysis time to a matter of hours

AI and Counterterrorism



Osama bin Laden, the architect of the September 11 attacks and numerous other atrocities, was killed on the night of May 2, 2011 in one of the most important counterterrorism strikes in American history. In an [interview](#)³ following the raid, one of the operatives recalled a member of his team escaping bin Laden’s compound with a computer terminal in one hand and a bag full of electronic devices in the other. Much of the data recovered from bin Laden’s personal devices has been declassified and published under the title, “Bin Laden’s Bookshelf.”

But before this data was scrubbed and released, it was delivered to the clearinghouse for data seized on the battlefield. Bin Laden’s data might have the highest profile, but it represents just a tiny fraction of the intelligence seized from terrorist organizations since 9/11. Devices captured in counterterrorism operations frequently provide new insights into terrorist plots, inner workings, whereabouts and motivations. However, extracting actionable intelligence from raw data is an onerous process. AI tools now help analysts automate parts of this process through image recognition and natural language processing, allowing them to keep pace with the onslaught of data they face every day.

AI adoption in the national security sector has only just begun. The volume of military-related data is immense, and finding meaningful intelligence quickly is paramount. The Defense department recently announced its \$2 billion [AI Next](#)⁴ campaign to create “more trusting, collaborative partnerships between humans and machines” and established the Joint Artificial Intelligence Center to “promote collaboration on AI-related research and development among military service branches, the private sector and academia.” In the future, AI can and should do much more to modernize how the defense and intelligence communities interact with data to keep us safe.

3. 60 Minutes Presents: Killing bin Laden (<https://www.youtube.com/watch?v=UzI0GPU0vLE>)
4. Defense Department pledges billions toward artificial intelligence research (https://www.washingtonpost.com/technology/2018/09/07/defense-department-pledges-billions-toward-artificial-intelligence-research/?utm_term=.23172e14b327)