AI in National Security, Real Use Cases

Introduction

The integration of artificial intelligence into everyday operations is already well underway across federal agencies. Below is a non-comprehensive selection of use cases demonstrating how different national security missions are already using AI today.

U.S. Department of Defense

Chief Data and Artificial Intelligence Office's (CDAO) ADVANA

ADVANA, "advancing analytics," is a cloud-based data analytics platform developed by the U.S. Department of Defense to integrate and analyze vast amounts of data from across military and defense systems. It combines information from various domains, including financial, operational, and logistics data, into a unified view, enabling advanced analytics, AI, and machine learning to generate insights that inform strategic and operational decision-making. The platform enhances resource allocation, mission planning, and risk management, while supporting real-time data access and collaboration across DoD entities. With a user-friendly interface and a focus on security, ADVANA helps optimize the DoD's operations and improve overall efficiency.

Sources:

- DOD Chief Digital and AI Office Introduces New Advana at Industry Day: Conference Spurs Industry Involvement in the Expansion of DOD's Largest Big-Data Platform, U.S. Department of Defense (2024).
- Melody Durham & Tonja Carter, ADVANA Overview, Defense Logistics Agency (last accessed 2025).

U.S. AirForce: NIPRGPT; U.S. Army CAMOGPT

NIPRGPT and CAMOGPT are both large language model-based, AI-driven platforms developed by U.S. intelligence and military agencies to enhance data processing and decision-making. NIPRGPT, designed by the Air Force Research Laboratory, is an experiment with Generative AI technology for analyzing and extracting insights from text data (all non-classified at this point in testing) to support national security efforts. It enables rapid and accurate text summarization,

context extraction, and pattern detection to assist analysts in making informed decisions. CAMOGPT is tailored for military operations, using AI to assist with contextual analysis of mission-critical data, such as battlefield reports, intelligence briefings, and logistics data. Some capabilities include award writing, summarizing or editing products, or drafting reports. By combining AI, domain-specific contextual understanding, and closed-domains for secure use, both platforms aim to accelerate the decision-making process, improve situational awareness, and enhance operational efficiency in intelligence and military contexts.

Sources:

- Lori McFate, Operationalizing Science at JMC with Artificial Intelligence and Machine Learning, U.S. Army (2024).
- Department of the Air Force launches NIPRGPT, U.S. Air Force (2024).

National Geospatial-Intelligence Agency: Project Maven

Project Maven is a U.S. Department of Defense initiative aimed at leveraging artificial intelligence (AI) and machine learning to enhance the analysis of vast amounts of video data, particularly from unmanned aerial systems (UAS). Officially known as the Algorithmic Warfare Cross-Functional Team, Project Maven seeks to accelerate the DoD's ability to process, analyze, and interpret imagery and video surveillance data to support military operations and national security objectives. By applying AI-driven algorithms to identify objects, track movements, and recognize patterns in video feeds, the project enables faster and more accurate intelligence assessments, ultimately improving operational decision-making.

Source:

- Saleha Mohsin, Inside Project Maven, the US Military's AI Project, Bloomberg (2024).

U.S. Army: Maven Smart System (MSS)

The U.S. Army developed the Maven Smart System (MSS), an AI-based decision-support tool, to enhance military targeting processes through iterative refinement during the Scarlet Dragon exercises. These exercises involved simulations and live-fire drills to identify, prioritize, and strike lawful targets, integrating development-security-operations (DevSecOps) practices for continuous improvement. MSS leverages sensor data, computer vision algorithms, and streamlined workflows to help operators quickly identify targets, seek approvals, and assess battle damage while ensuring compliance with laws and responsible AI policies. It dramatically increases efficiency by providing direct access to satellite data, automating target identification,

and digitally managing workflows, compared to the manual, error-prone traditional process. Notably, the 18th Airborne Division achieved targeting efficiency comparable to the historic Operation Iraqi Freedom targeting cell, with a mere fraction of the personnel (20 vs 2,000), paving the way for a new vision of making thousands of battlefield decisions per hour.

Sources:

- Emelia Probasco, Building the Tech Coalition: How Project Maven and the U.S. 18th Airborne Corps Operationalized Software and Artificial Intelligence for the Department of Defense, Center for Security and Emerging Technology at 3-5 (2024).
- Mark Pomerleau, U.S. Military Deploys Maven Smart System for Hurricane Helene Disaster Response, Defensescoop (2024).

CDAO and Defense Innovation Unit (DIU): The Replicator Initiative

The Pentagon's Replicator Initiative is a rapid-fire effort to field thousands of autonomous systems across various domains, including air, land, sea, and space, within the next two years. This initiative aims to counter China's rapid military modernization by developing and deploying low cost, reusable unmanned drones. The goal is to overwhelm adversaries with a swarm of autonomous systems, making it difficult for them to defend against. The Replicator Initiative prioritizes speed and scalability, leveraging commercial technologies and innovative acquisition processes to rapidly field new capabilities. By focusing on operational needs and streamlining bureaucracy, the Pentagon aims to deliver critical capabilities to the warfighter at an unprecedented pace.

Sources:

- Jon Harper, Pentagon Contemplating AI Hub for Replicator Initiative; Hill Briefings Underway, Defensescoop (2024).
- Joseph Clark, Defense Innovation Official Says Replicator Initiative Remains On Track, DOD News (2024).

U.S. Army: Project Linchpin

Project Linchpin is a U.S. Army initiative focused on the acquisition and integration of AI-powered technologies to enhance defense capabilities. Recognizing the prohibitive costs of integrating individualized sensor AI capabilities to separate program offices within the Army's Program Executive Office for Intelligence, Electronic Warfare and Surveillance (PEO IEW&S), Project Linchpin centralizes efforts to increase efficiency and lower costs. The project aims to

establish an AI solutions pipeline within IEW&S, with the potential to eventually serve as the acquisition model for the greater Army. Project Linchpin utilizes a phased contracting approach that can expedite the traditionally slow military acquisitions process to ensure access to the most advanced AI-powered technologies available from private companies. The overall success of the program would see the creation of a reliable ecosystem of industry partners providing AI solutions to U.S. defense issues.

Sources:

- Kimberly Underwood, Project Linchpin Aims to Be the Keystone for Army Artificial Intelligence, AFCEA International, Signal Media (2023).
- Developing an AI/ML Operations Pipeline: Project Linchpin, Program Executive Office: Intelligence, Electronic Warfare, and Sensors (PEO IEWS) (2023).

U.S. Army: Project Convergence

Project Convergence is another Army-led defense modernization effort aimed at bridging the gap between a technology's development and the military's purchase and deployment. Though not explicitly AI focused, the project's central goal is to integrate emerging technology and capabilities to improve future readiness. First established by the Army Futures Command (AFC), the project leverages data analytics to inform decision making and prioritization, and emphasizes collaboration and interoperability between the services as well as with allied forces. While Project Convergence testing and experimentation is ongoing throughout the year, the Army also hosts events like the Project Convergence Capstone 4 (PC-C4), a joint and multinational forum to experiment with integration capabilities, such as specialty drones used in long-range targeting and robot-soldier pairing in the field.

Sources:

- Remarks by Acting Commanding General of Army Futures Command Lt Gen James Richardson, et al., at Panel on Project Convergence: An Experiment for Multidomain Operations, Center for Strategic and International Studies (2022).
- Colin Demarest & Jen Judson, What Project Convergence Will Look Like After Bucking Its Yearly Rhythm, C4ISRNet (2023).
- Army Spc. Jackson Grey, Project Convergence Capstone 4 Works to Integrate Joint, Multinational Defense Systems, U.S. Department of Defense (2024).

U.S. Navy: The Orca

The XLUUV (extra-large unmanned underwater vehicle), also known as the “Orca”, is an autonomous submarine developed by Boeing for the U.S. Navy. It is designed to perform a variety of missions, including mine operations, anti-submarine warfare, tracking surface vessels, and intercepting communications from other vessels. The Orca is autonomous, powered by a hybrid combination of battery technology and marine diesel generators, and is capable of operating independently for multiple months. It utilizes AI for navigation, sensor data processing, and mission planning, making it a valuable asset for the Navy's future operations. The first Orcas were delivered by Boeing in December 2023; testing is ongoing.

Sources:

- Jon Harper, Navy Receives First Orca Unmanned Submarine from Boeing, Defensescoop (2023).
- XLUUV, Boeing (last accessed 2025).
- Orca XLUUV, USA, Navy Technology (2024).

U.S. Navy: Task Group 59.1

U.S. Naval Forces Central Command's Task Force 59 established Task Group 59.1, focusing on the operational deployment of unmanned systems integrated with manned operators to enhance maritime security in the Middle East. Led by Lt. Luis Echeverria, a surface warfare officer with extensive unmanned systems experience, the group aims to seamlessly incorporate emerging technologies into naval operations. Task Force 59, the Navy's first Unmanned and Artificial Intelligence Task Force, has tested and operated over 23 different unmanned systems since its inception in September 2021. By integrating unmanned systems and artificial intelligence, Task Group 59.1 seeks to advance manned-unmanned teaming concepts, thereby strengthening regional maritime security and stability.

Source:

- Task Force 59 Launches New Unmanned Task Group 59.1, U.S. Navy (2024).

U.S. Army: Project Athena

The Army's Project Athena is a pilot initiative to assess generative artificial intelligence (genAI) tools and platforms for streamlining business operations and supporting various service components. Led by Chief Information Officer Leonel Garciga and the Office of Enterprise

Management, the effort evaluates use cases, cost models, and deployment architectures of commercial genAI technologies, with a focus on enabling Army organizations to choose the most suitable capabilities. The tools have shown promise in legal, public affairs, recruiting, and document analysis tasks, offering immediate benefits for non-warfighting functions. A significant aspect of the project involves informing leaders about the costs and infrastructure needs of implementing genAI, such as cloud storage and compute requirements, to ensure cost-effective adoption. Upon the pilot's conclusion in April, the Army plans to issue guidance based on lessons learned, standardizing processes for integrating genAI into enterprise-level operations.

Source:

- Mikayla Easley, Army Evaluating Generative AI Tools to Support Business Ops, Defensescoop (2025).

U.S. Air Force: Variable In-Flight Simulator Aircraft (VISTA)

The U.S. Air Force has conducted groundbreaking dogfights using the X-62A VISTA, a modified F-16 piloted by artificial intelligence, as part of DARPA's Air Combat Evolution (ACE) program. These tests showcased AI's ability to execute complex aerial maneuvers and adapt in high-stakes environments, demonstrating its potential in air combat. The program aims to build trust in autonomous systems and develop Collaborative Combat Aircraft (CCA), autonomous drones designed to work alongside human-piloted jets. The Air Force plans to deploy over 1,000 AI-driven aircraft by 2028 to enhance air superiority. This milestone highlights the transformative potential of AI in reshaping military aviation and operational strategies.

Sources:

- Stephen Losey, US Air Force Stages Dogfights with AI-Flown Fighter Jet, Defense News (2024).
- Gary Hatch & Mary Kozaitis, SecAF Kendall Experiences VISTA of Future Flight Test at Edwards AFB, U.S. Air Force (2024).

U.S. Department of Homeland Security

Homeland Security Investigations (HSI)

The Homeland Security Investigations (HSI) ran a pilot to integrate large language models into investigative processes, enabling quick and precise summaries of law enforcement reports. They also tested semantic search capabilities, allowing officers to sift through vast repositories of documents with ease. Leveraging open-source AI provided HSI with the flexibility to experiment and assess the effectiveness of these emerging tools. The pilot showed that using LLM-based summaries and semantic search bolstered both the accuracy and efficiency of investigative work. HSI continues to refine these open-source solutions, aiming to further enhance the speed and quality of its law enforcement activities.

Source:

- Fact Sheet: DHS Deploys Pilot Programs, Expands Efforts to Leverage AI to Secure Nation's Critical Infrastructure, Department of Homeland Security, (2024)

U.S. Citizen and Immigration Services (USCIS)

The U.S. Citizenship and Immigration Services (USCIS) launched a pilot for a generative AI tool that lets immigration officers practice conducting refugee and asylum interviews. This pilot enhanced training by offering opportunities to practice every day tasks such as eliciting testimony. From this pilot, USCIS is exploring other ways that generative AI can strengthen officer and workforce training. For now, the pilot is strictly for educational purposes and does not influence actual immigration eligibility decisions.

Source:

- Artificial Intelligence Use Case Inventory, U.S. Department of Homeland Security (2025)

DHSChat

The Department of Homeland Security expanded its efforts to integrate generative AI into its workforce by creating the DHSChatbot. This tool was created to enhance cybersecurity, communication, collaboration, and engagement between the department, public and industry partners. The department is also focused on ensuring AI's responsible deployment by establishing the AI Safety and Security Board and engaging with civil rights organizations to

protect privacy and civil liberties. These actions are part of DHS's broader effort to advance AI's potential while addressing risks and ensuring public safety.

Sources:

- Fact Sheet: DHS Deploys Pilot Programs, Expands Efforts to Leverage AI to Secure Nation's Critical Infrastructure, Department of Homeland Security (2024)
- Fact Sheet: DHS Completes First Phase of AI Technology Pilots, Hires New AI Corps Members, Furthers Efforts for Safe and Secure AI Use and Development, Department of Homeland Security, (2024)

U.S. Department of State

An artificial intelligence system called "Northstar" was developed to inform State Department efforts to shape public narratives and policy by monitoring media reports and social platforms. Northstar could ingest around one million articles a day in over 100 languages, then translate and synthesize their content for Public Diplomacy officers. The "Statechat" is another internal tool that assists in consolidating the ample unclassified research that State Department analysts document annually, from Congressional reports, to regional executive summaries for diplomats, to specialty subjects such as human trafficking and human rights reports.

Sources:

- Mariam Baksh, State Dept. looking to combat disinformation, using AI to monitor social media, Inside AI Policy (2024)
- Alexandra Kelley, State's AI chatbot journey started with collaboration, Nextgov (2024)

U.S. Department of Commerce

National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) uses an AI heat mapping program that leverages artificial intelligence and machine learning to enhance the monitoring and prediction of environmental heat patterns, particularly in relation to climate change and urban heat islands. The program uses advanced algorithms to analyze vast amounts of data from satellites, weather stations, and other sources to generate high-resolution heat maps that identify areas of extreme heat. These heat maps are crucial for understanding the impacts of rising temperatures on both human health and ecosystems, particularly in densely populated urban areas where heat can exacerbate health risks. By integrating AI, NOAA's program improves the accuracy of heat forecasts, enables real-time tracking of temperature anomalies,

and helps inform policy decisions aimed at mitigating heat-related risks, promoting urban planning strategies, and enhancing disaster preparedness efforts.

Source:

- National Centers for Coastal Ocean Science, "Image Analysis, Artificial Intelligence, and Deep Learning," U.S. Department of Commerce (Accessed January 2025).

U.S. Department of Energy

Lawrence Livermore National Laboratory AI Innovation Incubator (AI3)

The Lawrence Livermore National Laboratory's AI Innovation Incubator (AI3) is a collaborative hub that brings together experts from LLNL, industry, and academia to advance artificial intelligence for large-scale scientific and commercial applications. AI3 aims to foster new partnerships, stimulate innovation, and accelerate the development and application of AI technologies to address critical challenges in areas like nuclear security, climate science, and materials science. The central aims of AI3 are to expand capabilities through collaboration, grow AI innovation capabilities, serve as a leader in AI for applied science, and coordinate an AI investment strategy.

Source:

- Data Science Institute, "AI3: AI Innovation Incubator," Lawrence Livermore National Labs (Accessed January 2025).

Pacific Northwest National Laboratory Partnership with Microsoft for Materials Discovery

The Pacific Northwest National Laboratory's (PNNL) collaboration with Microsoft combines the lab's scientific expertise with Microsoft's advanced computing capabilities to accelerate energy storage innovation. The partnership leverages artificial intelligence and high-performance computing to identify promising materials and chemical compounds at unprecedented speeds. The central aims of this collaboration are to transform the pace of scientific discovery, advance energy solutions, pioneer new approaches in computational chemistry, and establish a new paradigm for AI-assisted materials research. Initial results have already demonstrated success, reducing the process of synthesizing and testing new battery compounds to weeks instead of years.

Sources:

- Karyn Hede, PNNL Kicks Off Multi-Year Energy Storage, Scientific Discovery Collaboration with Microsoft, Pacific Northwest National Laboratory (2024).
- Catherine Bolgar, Discoveries in Weeks, Not Years: How AI and High-Performance Computing are Speeding Up Scientific Discovery, Microsoft (2024).

Intelligence Community

OSINT Data Collection and Intelligence Analysis

Open-source intelligence is the collection and analysis of publicly and commercially available data to support strategic decision-making. AI-driven OSINT has become vital for national security, allowing government agencies like the CIA, FBI, and DIA to gather and analyze enormous amounts of publicly accessible data—from social media and news outlets to commercial databases and satellite imagery. By using machine learning and natural language processing, these agencies can monitor real-time geopolitical events, detect emerging threats, and even predict troop movements or cyberattacks far more efficiently than manual methods. The CIA's Open Source Enterprise (OSE), as an example, plays a key role by integrating AI tools to rapidly evaluate and interpret information from these diverse sources with one example being its OSIRIS program which leverages a large language model to rapidly collate and summarize massive datasets, ensuring policymakers receive actionable insights faster and with greater accuracy.

Source:

- Jennifer Ewbank, The Role of Artificial Intelligence in the U.S. Intelligence Community: Current Uses and Future Developments, The Aspen Institute (2024)