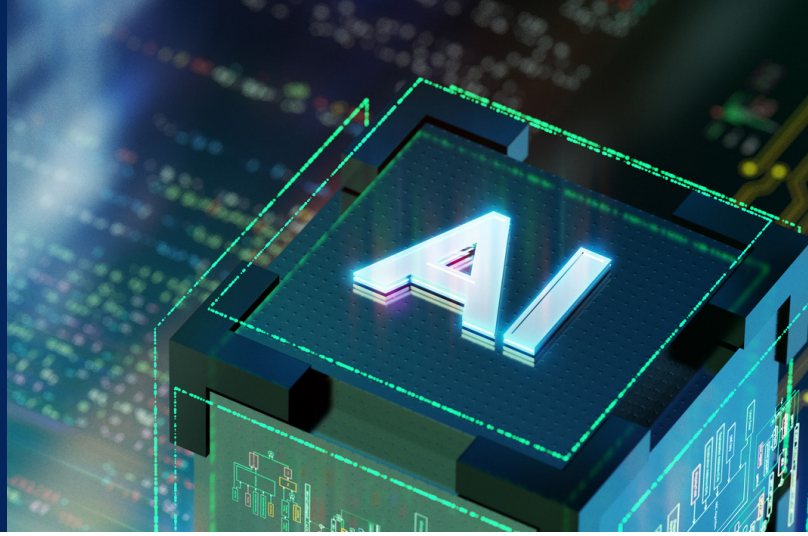
GE Aerospace

AI @ GE Aerospace



Artificial intelligence (AI) can accelerate the innovation needed to help the aerospace industry create safer and more efficient skies, maintain quality, and support a strong national defense.

GE Aerospace, one of the largest AI patent holders in the aviation industry, has been using AI for more than a decade. Here's how.

ENSURE SAFETY & QUALITY

GE Aerospace engineers are integrating AI to enhance inspections, identify possible issues sooner, and increase aircraft utilization.

Deploying AI-Enabled Blade Inspection Tool
GE Aerospace is deploying a new, AI-enabled tool to improve inspection accuracy and consistency for key components of narrowbody aircraft engines, helping return engines to service sooner amid continued air travel demand.

Trained technicians use the AI-enabled Blade Inspection Tool to take images of turbine blades that are responsible for producing much of the engine's thrust. AI then guides technicians on the selection of which images to review, providing more consistency to spot issues sooner while cutting inspection times in half to around 1.5 hours.

Monitoring Engines 24×7
GE Aerospace monitors commercial engines 24×7 and uses digital insights to help identify predictive maintenance measures that enhance the quality of service. Advanced AI and machine learning models allow for more conditions to be monitored with even greater accuracy. This has enabled a 60-percent earlier lead time in identifying preventative maintenance recommendations, a 45 percent increase in detection rates, and cut the number of false alerts in half over the past decade.

SUPPORT U.S. NATIONAL DEFENSE

GE Aerospace's central research hub in Niskayuna, NY, has been working closely with defense agencies like the Defense Advanced Research Projects Agency (DARPA) for more than a decade on various programs to advance the fundamental capabilities of AI. A major focus has been advancing what DARPA calls the Third Wave of AI, or contextual adaptation, where systems can acquire new knowledge through generative contextual and explanatory models.

Advancing Knowledge of New Materials for Hypersonic Vehicles
GE Aerospace collaborated with DARPA on the Materials Architectures and Characterization for Hypersonics (MACH) program, leveraging AI to develop and demonstrate cutting-edge materials for hypersonic vehicles. This initiative led to the discovery of innovative approaches that could drive revolutionary advancements in extreme high-temperature materials and thermal management system designs, particularly for cooling leading edges.

Increasing Military Readiness
GE Aerospace has been working with the Defense Logistics Agency (DLA) and United States Air Force (USAF) on a trial program, using AI to help increase pilot training. The program is able to better predict when engine spare parts are needed for the J85 product line, which powers the USAFs fleet of T-38 trainers, helping to reduce aircraft downtime.

AI to Help Leaders Make Critical Decisions
GE Aerospace researchers integrated generative AI with computer vision to demonstrate AI with advanced, high school level learning capabilities as part of DARPA's Environment-Driven Conceptual Learning program. The team is developing a system that has the potential to help when the military needs to analyze never-before-seen images and video to make decisions when time is short.

IMPROVE EFFICENCY

GE Aerospace is applying AI across its operations to increase aircraft efficiency and utilization while helping employees work more efficiently and productively in every part of the company.

Part Prediction for MRO Delivery
MRO organizations often face unplanned increases in the scope of work for engines that come in for service. This impacts material availability, engine routings optimization, and labor. By using AI-based digital twin models, GE Aerospace has been able to forecast final work scopes and parts required to do a repair months before an engine's induction date.

Improving Fuel Efficiency
GE Aerospace's Fuel Insight software solution seamlessly integrates an aircraft's original flight data with the airline's operational data. Using a powerful suite of analytics and reporting tools, it provides airline operators with trends and actionable insights to optimize their fuel efficiency.

'AI Wingmate' Generative AI Platform
AI Wingmate is GE Aerospace's internal generative AI platform that its 53,000 employees actively use to streamline common, daily work tasks, while freeing up more time to innovate and solve customer problems. With AI Wingmate, every employee has a smart assistant to help them work more efficiently and be more productive.

GUIDING PRINCIPLES FOR RESPONSIBLE AI USE

As GE Aerospace evaluates, develops, and explores new applications of AI, it follows three guiding principles:

1. The data must be trusted. GE Aerospace takes a very methodical, structured approach to select the right data to train models.
2. The AI must be fully transparent, so that there is a full understanding and view of an AI model's insights and actions.
3. There must always be a human in the loop. AI systems are enabling faster decisions, but the decisions are still being made by humans with help/insights from the AI models.