CNA

Harnessing Artificial Intelligence and Machine Learning in the Public Sector

CNA is dedicated to helping the public sector leverage the benefits of artificial intelligence (AI) and machine learning (ML) safely, responsibly, and efficiently. Our portfolio of projects includes both research and strategic planning for AI/ML integration as well as prototyping and supporting the use of AI/ML solutions.

Research and Strategic Planning

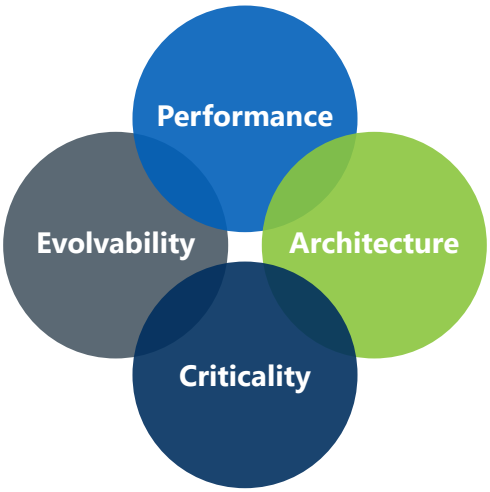
We use our expertise to support strategic planning and develop frameworks that guide the use of AI for government agencies. Considerations include industry and scientific trends, best practices, public safety, rights and privacy protection, and interpretability. We account for an agency's priorities and develop recommendations that can address current and future AI challenges.

Example: Frameworks for AI/ML Integration

CNA supports federal agencies such as the Federal Aviation Administration (FAA) and the Department of Health and Human Services (HHS) as they plan for the integration of AI. We understand the need to tailor approaches to organizational domains and have developed responsible AI principles and assurance frameworks that incorporate mission-specific objectives. For example, we co-developed a classification scheme for AI/ML technologies that can inform processes for formal approval and acceptance. We have also developed assessments and guidance for evaluating usability, risk, and compliance of AI technologies.

Example: PACE Concept

The PACE acronym stands for Performance, Architecture, Criticality, and Evolvability. The PACE concept is a high-level approach to AI risk management, with each PACE category capturing a component of AI risk. We constructed and aggregated these categories from AI risk concepts used by several agencies (e.g., Department of Energy, National Institute of Standards and Technology (NIST), Food and Drug Administration). Although AI performance considers minute details, encompassing these on a higher level allows more holistic understanding of AI risk.



The pillars of PACE are interrelated and complement one another.

Example: Exploring Generative AI

At CNA, we are pioneering the use of agentic AI architectures to enhance the capabilities of generative models. Our Data Analysis Agent can simulate the core responsibilities of a human data analyst, providing

insightful visualizations and answering data-related queries interactively. The Podcast Creator Agent transforms academic research papers into engaging audio summaries, making complex content accessible to a broader audience. In addition, our Notices to Airmen (NOTAMs) Agent simplifies aviation notices by filtering and summarizing them for easier human review. These initiatives demonstrate our commitment to leveraging AI to solve real-world problems while ensuring safety and accountability through robust risk mitigation strategies.

Prototyping and Support

We have experience supporting the integration of AI into government agency operations. We have been involved in every step of the process, from literature review to concept development to model development and validation, to support or develop highly tailored AI prototypes for each client's specific needs.

Example: Identification of Use Cases

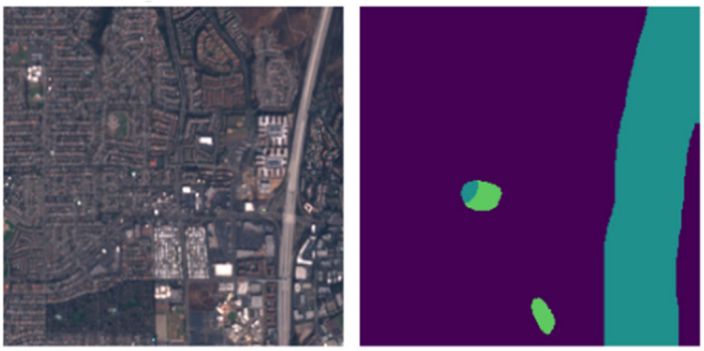
We understand the importance of evaluating the appropriateness of applying an AI/ML solution to a problem. The benefits of using AI/ML techniques to solve a problem must be considered regarding factors such as data availability, maturity of models, user acceptance, and risk. We have assisted our clients (e.g., FAA, HHS) in identifying, prioritizing, and selecting use cases based on our expert knowledge of business processes, operational concepts, and data sources of interest to ensure appropriate applications of AI/ML technologies.

Example: FAA NextGen Prototypes

Our team supports AI prototyping efforts at the FAA Office of NextGen. We have developed concepts for new AI technologies that enhance traffic flow management and provided subject matter expertise and data analysis for related development teams. We have constructed generative data models for generating synthetic flight and weather data for aviation use cases.

Example: AI Challenge Solutions

We have developed award-winning AI solutions for government challenges. Our NIST First Responder Awareness Monitoring During Emergencies (FRAME) prototype classifies data from Internet of Things sensors into a situational awareness dashboard. Our DOT Safe Warnings for Intersections Forecasting Tool (SWIFT) identifies road users and predicts collisions. Our Wildfire Threat Detection for Transportation Infrastructure using U-Net Semantic Segmentation project uses a customized U-Net convolutional neural network to detect and outline wildfire-affected areas in satellite imagery (see image).



Satellite image (left) with AI-generated masking of critical infrastructure (right).

About CNA

CNA is a not-for-profit analytical organization dedicated to the safety and security of the nation. With nearly 700 scientists, analysts, and professional staff across the world, CNA's mission is to provide data-driven, innovative solutions to our nation's toughest problems. It operates the Center for Naval Analyses—the Department of the Navy's federally funded research and development center (FFRDC)—as well as the Institute for Public Research. The Center for Naval Analyses provides objective analytics to inform the decision-making by military leaders and ultimately improve the lethality and effectiveness of the joint force. The Institute for Public Research leverages data analytics and innovative methods to support federal, state, and local government officials as they work to advance national and homeland security.

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