ARTIFICIAL INTELLIGENCE AND THE EMERGENCY SERVICES SECTOR

WHAT IS ARTIFICIAL INTELLIGENCE (AI)?

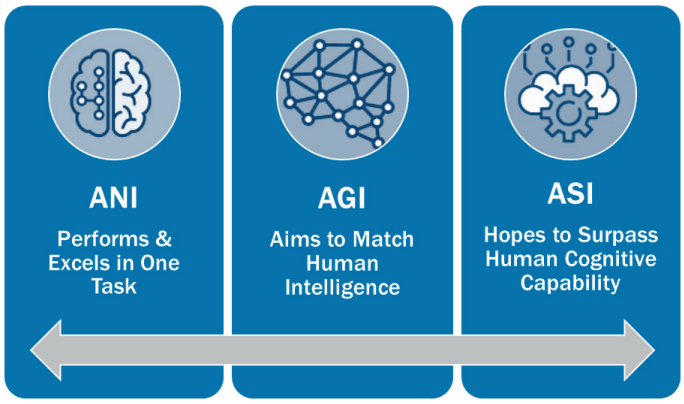
The term 'artificial Intelligence' according to 15 U.S.C. 9401(3) is:

> ***A machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments***

Artificial intelligence systems use machine- and human-based inputs to:

- Perceive real and virtual environments
- Abstract such perceptions into models through analysis in an automated manner
- Use model inference to formulate options for information or action

OVERVIEW OF AI CATEGORIES



Artificial Narrow Intelligence (ANI): also called 'Weak AI', ANI is designed and trained to perform specific tasks. It has ability to enable robust applications such as Apple Siri, Amazon Alexa, Microsoft Copilot, OpenAI ChatGPT, Google Bard, IBM Watson, and self-driving cars.

Artificial General Intelligence (AGI): aims to create machines that can match human intelligence in terms of self-awareness, problem-solving ability, learning, and future planning.

Artificial Super Intelligence (ASI): would exceed the cognitive capacity and competence of the human brain. Although the idea of such strong AI exists, there is currently no practical application of it in use.

AI IN THE CONTEXT OF THE EMERGENCY SERVICES SECTOR (ESS)

AI applications can positively enhance ESS work on the ground by improving efficiency, accuracy, and decision-making processes. There are various key areas where AI can be impactful such as call prioritization and dispatch optimization, predictive analytics and risk assessment, real-time patient monitoring and triage, natural language processing for enhanced communication, image and video analysis for medical diagnosis or policing, and robotic assistance for search and rescue.

Fire and Rescue: AI for disaster prediction, response coordination, and HAZMAT management

EMS: AI in medical triage, emergency incident prediction, and resource allocation

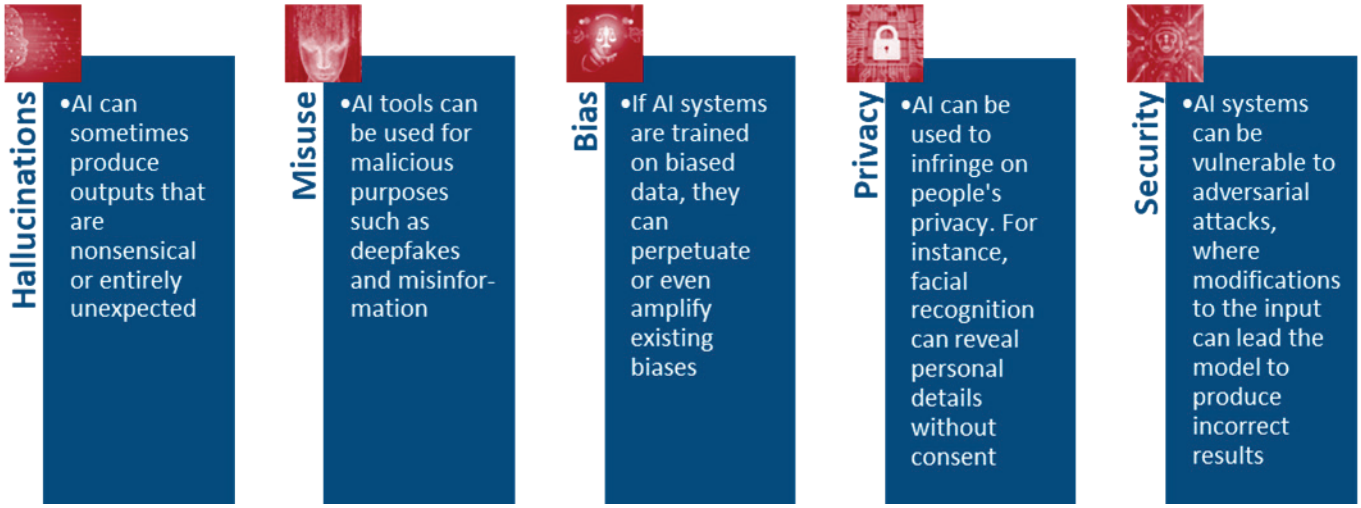
Law Enforcement: AI in crime analysis, evidence processing, and predictive policing

Emergency Management: AI in risk assessment, evacuation planning, and relief operations

Public Works: AI in traffic management and infrastructure condition assessment

AI RISKS OF ADVERSARIAL USE

As AI-enabled software systems become increasingly prevalent among adversaries, the cyber threat landscape is expanding rapidly. In this context, it is crucial for ESS to be aware of the potential risks associated with using AI, such as hallucinations, misuse, statistical bias, privacy concerns, alignment issues, safety concerns, autonomy, and control. In addition, the quality of the AI output can pose risks that should be taken into consideration.



AI SECURITY CONSIDERATIONS

While deploying and operating AI systems, the ESS should be mindful of security considerations to ensure the safety and security of these systems. CISA's *Guidelines for Secure AI Systems Development* suggests four key areas within the AI system development life cycle: secure design, secure development, secure deployment, and secure operation and maintenance.

AI USE BY THE ESS

A growing number of Law Enforcement, Fire and Rescue Services, Emergency Medical Services, Emergency Management, and Public Works organizations have recognized the benefits of integrating AI applications and tools into their operations. By leveraging AI technology, these organizations are able to enhance the efficiency, accuracy, and decision-making processes of their respective departments, ultimately helping them better serve their communities and keep people safe.

AI Use Cases in the ESS	
Law Enforcement	22 police departments around the country are deploying an AI body-camera review tool that automatically scores an officer's language and detects events like use-of-force
Fire and Rescue Services	WA State is using an AI product for wildfire detection to help detect, identify, and extinguish new ignitions before they become threats
EMS	Organizations can now use an AI-facilitated tool that guides emergency call center dispatchers in determining status, condition, and real-time recommendations for patient care and dispositions in the field
Emergency Management	A national lab has developed an AI tool providing situational awareness and damage assessment within hours of a natural disaster or other emergencies
Public Works	Cities can now benefit from a digital platform to trial and advance the usage of AI to improve public services

TOOLS, TRAINING, AND PROGRAMS

DHS, Artificial Intelligence Use Case Inventory: This inventory contains on-classified and non-sensitive AI use cases. dhs.gov/data/AI_inventory

CISA AI Use Cases: This webpage provides an overview of examples and use cases of AI efforts that are underway at CISA. cisa.gov/ai/cisa-use-cases

U.S. General Services Administration's AI Community of Practice (AICoP): This resource provides training sessions intended to introduce concepts and theory around AI to empower federal employees with awareness of the technical concepts underlying AI. coe.gsa.gov/2023/09/06/ai-update-6.html

NIST Trustworthy & Responsible Artificial Intelligence Resource Center (AIRC): The center supports and operationalizes the NIST AI Risk Management Framework (AI RMF 1.0) and accompanying Playbook and will grow with enhancements to enable an interactive, role-based experience providing access to a wide-range of relevant AI resources. airc.nist.gov/home

System Assessment and Validation for Emergency Responders (SAVER) Program: DHS Science and Technology Directorate (S&T) National Urban Security Technology Laboratory (NUSTL) manages the SAVER Program to assist emergency responders in making procurement decisions including AI powered products. dhs.gov/science-and-technology/saver

NITRD, AI Research Program Repository: Allows users to find funding and collaboration opportunities through a directory of active Federal AI research programs. nitrd.gov/apps/ai-research-program-repository/

The National Governors Association Center for Best Practices: This is a state resource list on AI that currently provides links to federal-level activities, state executive branch activities, state legislative actions, local-level activities, and resources for technical assistance. nga.org/wp-content/uploads/2023/10/State-Resource-List-on-AI-Oct-2023.pdf

Interpol Artificial Intelligence Toolkit: This Toolkit aims to help law enforcement agencies address the most pressing AI challenges. interpol.int/en/How-we-work/Innovation/Artificial-Intelligence-Toolkit

REFERENCES

The White House, Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence (October 2023) whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/

IBM, What is Artificial Intelligence (AI)? (n.d.) ibm.com/artificial-intelligence?utm_content=SRCWW&p1

CISA, CISA Roadmap for AI (November 2023) cisa.gov/resources-tools/resources/roadmap-ai

CISA & National Security Center, Guidelines for Secure AI Systems Development (November 2023) ncsc.gov.uk/collection/guidelines-secure-ai-system-development

Prnewswire. Carbyne Unveils Game-Changing Call Triage Capabilities Within its APEX Emergency Call Management Platform, Ushering in New Era for 9-1-1 Services (June 2023) prnewswire.com/news-releases/carbyne-unveils-game-changing-call-triage-capabilities-within-its-apex-emergency-call-management-platform-ushering-in-new-era-for-9-1-1-services-301851658.html

Washington State Department of Natural Resources, Commissioner Franz Announces New AI Wildfire Fighting Technology Pilot Partnership (March 2023) dnr.wa.gov/news/commissioner-franz-announces-new-ai-wildfire-fighting-technology-pilot-partnership

Prnewswire, 1St Police Department in Michigan to Deploy Body Camera Analytics (August 2023) prnewswire.com/news-releases/1st-police-department-in-michigan-to-deploy-body-camera-analytics-301891661.html

Pacific Northwest National Laboratory, Rapid Analytics for Disaster Response (n.d.) pnnl.gov/projects/rapid-analytics-disaster-response

Bloomberg, Bloomberg Philanthropies Launches City AI Connect for Mayors to Trial and Advance Generative Artificial Intelligence to Improve Public Services (October 2023) bloomberg.org/press/bloomberg-philanthropies-launches-city-ai-connect-for-mayors-to-trial-and-advance-generative-artificial-intelligence-to-improve-public-services/

FirstWatch, Helping 911 Professionals, Law Enforcement, EMS Systems, Fire Departments, and Public Health transform raw data into meaningful information in real-time (n.d.) firstwatch.net/

Robert Gerlach, NextGen Emergency Management and Homeland Security: The AI Revolution (April 2023) linkedin.com/pulse/next-generation-emergency-management-homeland-ai-gerlach-mpa-mep/

For more information, visit CISA | Emergency Services Sector or email the Emergency Services Sector Management Team at EmergencyServicesSector@cisa.dhs.gov.