MAP18

ARTIFICIAL INTELLIGENCE IN NATIONAL SECURITY APPLICATIONS

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Abstract

In recent years, we've explored use of artificial intelligence (AI) in the search for radiological and nuclear threat sources via a trailer-based system, a drone made of radiation sensing plastic, or wearable detectors. We've also used it to estimate detector system offsets and rotations in associated particle imaging. In ongoing research relevant to airport or border security, we're exploring the use of AI for contraband detection via dual x-ray and neutron cargo scanning. Research to date, conducted by teams of experimentalists, modelers, and AI experts, has combined simulation and modeling and proof-of-concept measurements. Some of the AI approaches that appear to hold promise in these national security applications, as well as challenges to be addressed, will be briefly described. In the DOE Defense Nuclear Nonproliferation's Enabling Capabilities in Technology (TecH) consortium that extends from 2025-2030, the consortium team plans to further explore driven-driven methods for detection, including multi-modal and multi-agent detection, tracking and assessment, as well as digital twins and AI tools for safeguards. We are also developing a Modern and Emerging AI Summer School that is scheduled to be delivered for the first time in 2026. These plans will be described.

Conference Track

Military Applications