EIMS – Enterprise Intelligence, Surveillance, and Reconnaissance (ISR) Modeling and Simulation



The Enterprise Intelligence, Surveillance, and Reconnaissance (ISR) Modeling and Simulation (EIMS) toolkit is a proven MATLAB-based collection of capabilities containing threat models, sensor models, and engagement models used to inform capability acquisition decisions.

What Is EIMS?

EIMS is a collection of MATLAB-based models, functions, and scripts that form a flexible and customizable framework used to answer questions such as: What is the best location for homeland defense radars? How robust is the radar system throughout an engagement or campaign?

EIMS was originally developed to model sensor architecture performance at a low to medium fidelity. Since then, EIMS has been expanded to represent all aspects of the kill-chain, modeling the physics and dynamics of threats, sensing, tracking, communications, command and control (C2), and engagement. Together, these models can assess mission-level measures of performance and effectiveness of integrated air and missile defense (IAMD) systems against ballistic missile, aircraft, and cruise missile targets. The EIMS toolkit is used to analyze and characterize strategic capabilities across threats, scenarios, protected assets, operational effect, and cost.



How Is It Used?

MITRE has 10 years of experience using the EIMS toolkit to collaborate with the United States Air Force (USAF), Combatant Commands (COCOMS), coalition partners, and other stakeholders on studies that have informed acquisition decisions by providing trade space exploration, analysis of alternatives, and concept development. These collaborations have informed key decisions regarding:

- Sensor design and selection
- Sensor placement, orientation, and integration
- Sensor-to-shooter dependencies
- C2 decision processes

EIMS interfaces with external models, including iGrafx BMC2 process models, Google Earth, and CESIUM.

Why Is It Used?

EIMS offers a robust set of output data along with automated metrics and visualization options for common analysis needs. Access to simulation data allows end users to customize end products to best meet their needs by informing and explaining analysis of alternatives decisions.

EIMS has been released to foreign partners under appropriate foreign disclosure authorities. The ability to release the tool to our foreign partners allows MITRE to closely collaborate with sponsor engineers on specific models needed to reflect the sponsor's defense environment.

Example: Integrated Air and Missile Defense Toolkit

The IAMD toolkit is an add-on analysis capability to the EIMS toolbox. The IAMD toolkit includes a Ballistic Missile Defense (BMD) analysis module, an Air and Cruise Missile (ACM) Defense module, and other supporting functionality for data input/output, scenario definition, an example simulation script, and visualization tools. The IAMD toolkit expands upon the core EIMS functionality of evaluating sensor architecture concepts, incorporating BMD and ACM models and battlespace simulations for evaluating the performance of single or multiple IAMD systems.

For information about MITRE's EIMS Toolbox, contact <u>isee@mitre.org</u>. For more information about MITRE, visit <u>mitre.org</u>.







MITRE's mission-driven teams are dedicated to solving problems for a safer world. Through our publicprivate partnerships and federally funded R&D centers, we work across government and in partnership with industry to tackle challenges to the safety, stability, and well-being of our nation.

