

Research Synopsis

Extension of MANPADS Decision Analysis Tools

This project builds on the MANPADS case study of Directional Infrared Countermeasures (DIRCM) countermeasures to develop a dynamic decision analysis model for evaluating multiple countermeasures to assist policy makers in choosing the most efficient options for combating a terrorist attack on commercial airliners.

Modeling Area: Decision Analysis

Case Studies Supported: MANPADS

Principle Investigator: Detlof Von Winterfeldt

Institution: CREATE

Other Investigators: Ryan Garcia, Yale

Brief Description:

This research is developing a dynamic decision analysis model that incorporates many of the relevant possibilities facing decision makers for protecting commercial airliners through anti-terrorism countermeasures. This work builds on existing CREATE decision analysis and threat assessment tools for efficient countermeasure allocation such as the recently completed MANPADS case study that focused on countermeasures against infrared missiles.

Objectives:

This research will develop a dynamic model that will include threat assessment and economic analysis of the many countermeasures that can be deployed to defend from potential terrorist actions against commercial aviation. The resulting model will include a versatile user interface and enable results sensitive to the user's evaluation of multiple key variables and probabilities.

Interfaces to other Center Projects:

This work will maintain a close interface with other risk analysis and economics projects on the MANPADS case study and the development of risk analysis tools under Dr. Von Winterfeldt.

Major Products and Customers:

Project deliverables will consist of a report that will develop one or more dynamic decision analysis models and user-friendly computer tools to evaluate countermeasures for terrorist threats to civil aviation for the MANPADS Countermeasures office at the DHS.

Technical Approach:

The methods developed will build on previous research on decision analysis methods for MANPADS countermeasures and the creation of user-friendly computer tools.

Milestones and Schedule:

- Review the literature (Week 1-2)
- Build a preliminary decision tree using the TreeAge pro software (Week 3-4)
- Revise the decision tree and populate with probabilities and payoffs (Week 5-6)
- Develop the complete decision tree using the TreePlan software (Week 6-7)

- Perform Sensitivity Analysis (Week 8)
- Write Report (Week 9-10)