**Conflict Analysis & Simulation Tool (CAST)**

CAST is a Modeling, Simulation, and Analysis (MS&A) framework utilizing Artificial Intelligence (AI) to rapidly simulate conflict scenarios for:

- Mission Effectiveness Analysis
- Requirements Analysis
- Trade Studies
- Technology Assessment
- Tactics/CONOPS Development
- Training

**Features**

- Flexible object-oriented, plugin architecture to support various modeling and analysis scenarios
- Interactive, real-time, and rapid execution
- Monte Carlo simulation allows for full reproducibility of scenario timeline
- Adversarial behavior or “conflict” modeling of Blue-on-Red forces in a scenario setting
- Support for multiple operational domains
  - Naval Warfare
  - Air-to-Air Warfare
  - Urban & Transportation Pathway Radiation Detection
- Explicit systems representations
  - Operators, vehicles, sensors, weapons, signatures, communications, etc.
- Artificial Intelligence (AI) agent behavior
- Man-In-The-Loop and constructive (AI vs AI) execution modes
- 2D/3D interface leveraging proven technologies from the commercial gaming industry
- Scenario editing capabilities
- Distributed Batch Execution mode
- Highly configurable inputs
  - System performance data, analytical models, etc.
- Licensing options include full source code

**Uses for CAST**

- MOE and MOP Analysis
- Trade Studies
- Force Composition Studies
- Live Fire Test and Evaluation (LFT&E)
- Total & incremental Cost Modeling
- Analysis of Alternatives

**ManTech integrated Commercial Brawler Air Combat Simulation (COBRA)** within CAST as a plugin module to enable the following:

- Ported COBRA source code from Unix environment over to Windows
- Implemented COBRA-side interface to allow for aircraft initialization
- Implemented CAST-side interface to
  - Initialize COBRA model
  - Hand over simulation of aircraft entities from CAST to COBRA
  - Monitor and visualize COBRA simulation state for aircraft being simulated within COBRA
  - Return control of aircraft back to CAST after end of COBRA simulation run

We continue to explore the development of CAST and COBRA for new enhancements and full integration capabilities.
Customizable Data Products
- MOEs / statistics
- Interactive reports
- 2D / 3D visualizations
- Simulation event logs
- Simulation databases

Current and Past Uses for CAST
- AAW mission effectiveness analysis for DD(X)
- Preliminary Design Review (PDR)
  - Aircraft & cruise missile threats
  - Environments, merchant traffic, offboard assets
- Small boat raid analyses
- Surface ship emission susceptibility analysis
- ASW mission effectiveness analysis
- CONOPS Development & Visualization
- Capability assessment of mobile radiation detectors in urban environments
- Domestic Nuclear Detection Office (DNDO) limited use experiment planning, system evaluation, and test visualization
- Campaign-level wargaming support and analysis for DNDO threat detection along multi-domain transportation pathway
- Aircraft Strike Mission Effectiveness Studies for Agency for Defense Development (ADD), South Korea
- Korea Institute for Defense Analyses (KIDA) effectiveness analysis for Korean KDX-I Upgrade Program

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