SAND2016-5356D

Remote Sensing System-Level Modeling & Simulation Capability

This capability includes the exploration, architecting, design, development, and verification/validation (V&V) plus uncertainty quantification (UQ) of both static and dynamic stochastic models integrated into simulation frameworks with the corresponding analysis tools and visualizations that can be applied to a variety of missions. This capability extends across the spectrum of real-time lower fidelity solutions suitable for system-level trade study and performance assessments to higher fidelity solutions suitable for system-level analysis, simulation-based test injection, and formal V&V.

Capabilities:

Modeling of:

- Nuclear weapon source signals
- Signal propagation through atmosphere
- Orbital mechanics of multiple satellite constellations
- Sensors and on-board processing
- Communications and downlinks
- Flexible and customizable sensor definitions using Lua

Simulation engines

- High-fidelity to lower-fidelity real-time
- Monte Carlo based with UQ
- Optimal spatial sampling
- Parametric study design to analysis

Data visualizations and charting

- 2D and 3D with statistics
- Global heat maps with statistics

Analysis

- Global, regional, and point performance
- Instantaneous or time averaged perf

Remote Sensing System-Level Analysis, Test, and V&V Capability

This capability includes the analysis, test, and characterization of complex remote sensing system mission functionality and performance features primarily through simulation. This includes application of depth and breadth in understanding of complex systems to advise on and perform system specification formulation, test design and execution, system performance assessment, model and algorithm development, trending, anomaly identification and investigation (simulation & operational), design and execution of high-fidelity system test endeavors, system research & development endeavors.

Capabilities:

- Applied understanding of complex system of systems
- Complex system test design, execution, analysis, and reporting
- Innovative analysis for a wide variety of customers and objectives
- Multi-disciplinary collaboration to achieve goals
- Design of tools for efficient and effective data mining, analysis, visualization, and reporting
- Software architectures, development, and best practices
- Ability to communicate results concisely and effectively in the context of the overall system
- Transform data into knowledge in order to shape very complex systems

Contact:

David Copithorne
505.844.7420
dcopith@sandia.gov

Aaron Niese
505.844.8365
adniese@sandia.gov

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. SAND NO. 2016-XXXX