At NPS, faculty members focus on education and research conducted specifically to increase the combat effectiveness of commissioned officers.

In my role, I am primarily responsible for conducting research and publishing results that directly support the needs and goals of the Navy, as well as the application of that research directly into the NPS curriculum to ensure that the education of NPS students remains relevant and current.

My work has focused on the integration of system architecture products with system analysis techniques, specifically the development of operational and combat models, through model-based systems engineering.

That research approach, termed Capabilities Focused Model-Based Systems Engineering (CF-MBSE), is conducted in direct support of broader Navy research projects.

One of my primary goals is to integrate my research experiences with student thesis research, please click on the links below to find out more about my research and teaching interests, as well as to review past and current projects and explore thesis opportunities.

Capabilities Focused Model-Based Systems Engineering: Research & Applications

System Definition

1. Requirements Definition
   - Initial system requirements (assumed in this paper to be unrefined) and analysis are selected.

2. Architecture Definition
   - DoDAF and DoDIL compliant architectures are built to support integration.

3. Baseline Modeling
   - Detailed models conforming to agent based, system dynamics are built to represent the environment.

4. Experimental Design
   - A broad set of inputs, variables, design components, and environmental conditions are bounded, and system configurations are defined.

5. Simulation Modeling
   - Each system configuration is simulated to capture variability and to understand the behavior of the system.

6. System Analysis
   - Computational models are developed in systems to measure the output of interest.

7. Dynamic Decision Support
   - Statistical methods are developed in systems to measure the output of interest.

8. Reporting & Documentation
   - Recommended system configurations and design decisions are written in system documentation.

Capabilities Focused Model-Based Systems Engineering: Academic Foundations

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