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.

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**Capabilities Focused Model-Based Systems Engineering: Research & Applications**

**System Definition**

1. Requirements Definition
2. Architecture Definition
   - Initial system requirements are established and a baseline architecture is defined.
   - DoD and industrial architecture requirements are defined.
   - The baseline architecture is validated and refined.

**System Modeling**

3. Baseline Modeling
   - Detailed models of system elements, agents, and system dynamics are built to represent an initial system configuration.
4. Experimental Design
   - A broad set of input variations is defined, including component, operational, and environmental conditions.
   - Baseline system configurations are defined.

**System Analysis**

5. Model Analysis
   - Statistical analysis tools and techniques are used to identify the variables and interactions that have the most significant impact on system performance.
6. Dynamic Decision Support
   - Statistical models are developed as surrogate models to reduce decision-related uncertainties.

**Observation & Documentation**

7. Reporting & Documentation
   - Recommended system configurations and design decisions are summarized in written reports and presentations (including model codes and analysis results).

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**Capabilities Focused Model-Based Systems Engineering: Academic Foundations**

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