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
2. Architecture Definition

Initial system requirements (assumed at a point to be satisfied) are established and an architecture model is selected

DoDAF and DoDML compliant architectures are built to represent an initial system configuration conducting a baseline set of behaviors

**System Modeling**

1. Baseline Modeling
2. Experimental Design
3. Simulation Modeling

A broad set of impact variables is considered to determine and manipulate the behaviors and environmental conditions that are modeled as system configurations are defined

Each system configuration specified in the experimental design is evaluated to capture variability and expediency inherent in complex systems

**System Analysis**

1. Model Analysis
2. Dynamic Decision Support
3. Reporting & Documentation

Statistical analysis tools and techniques are used to identify the variables and interactions that have the most significant impact on system performance

Statistical meta-models are developed as surrogates to more detailed models and used as the inputs to interactive decision support tools

Recommended system configurations and design decisions are summarized in written reports and presentations (including model codes and analysis results)

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

**Academic Foundations**