

Systems Engineering

Ph.D. Program

AREAS OF RESEARCH SPECIALIZATION (and Selected Research Topics)

Modeling and Simulation

- Developing Mathematical Models for Project Risk Management
- Distributed System Modeling
- Modeling and Simulation for Embedded Systems
- Complex Systems Modeling

Systems Engineering Processes and Design

- Simulation and Mathematical Optimization of Engineering Systems
- Performance and Cost Optimization of Embedded Systems
- Integration of Ontologies into System Engineering

System of Systems Architecting

- System of Systems
- Architecture Frameworks
- Executable Architectures
- Smart Systems Engineering
- Design for Flexibility
- System Architecture Evaluation
- End-to-End System Security
- High Speed Networks
- Wireless Networks
- Wireless Ad Hoc and Sensor Networks
- Information Assurance
- Vulnerability Assessments
- Reliability Analysis
- Network-Centric Collaborative Design
- Sustainable Development of Network Centric Infrastructure Systems

Computational Intelligence

- Neural Networks, Fuzzy Logic
- Evolutionary Programming
- Swarm Optimization for Intelligent Systems
- Approximate Dynamic Programming and Reinforcement Learning Application
- Data Mining
- Time Series Forecasting
- Clustering Algorithms
- Computational Intelligence in Game Theory

Human System Integration

- Human-Centered Complex Systems Design
- Modeling of Human Performance
- Integrating Human Components to System of Systems

Infrastructure Systems

- Health Monitoring of Infrastructure Systems
- Behavior of Infrastructure Systems Under Extreme Conditions
- Transportation Infrastructure Architecting
- Energy Infrastructure Systems
 - Smart Grid
 - Capacity Modeling and Analysis
 - Renewable Systems
 - Energy Reliability
- Structures

Recent Ph.D. Dissertation Titles

Searched Based System Architecture Development Using A Holistic Modeling Approach, *Renzhong Wang, August 2012*

Architecture Value Mapping: Using a Linguistic Information Representation Scheme and Fuzzy Cognitive Maps as a Reasoning Mechanism for Multi-Criteria Conceptual Design Evaluation, *Atmika Singh, December 2011*

Assessing System Architectures: The Canonical Decomposition Fuzzy Comparative Methodology, *Jason Dauby December 2010*

Modeling Network Traffic on a Global Network-Centric System with Artificial Neural Networks, *Douglas Keith Swift, December 2007*

Architecting System of Systems: Artificial Life Analysis of Financial Market Behavior, *Nil Hande Kilicay-Ergin, June 2007*