INCose defines Model-Based Systems Engineering (MBSE) as “the formalized application of modeling to support system requirements, design, analysis, verification, and validation activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases.” One very important development is the utilization of MBSE to develop distributed and hybrid (discrete-continuous) simulation modeling systems. MBSE can help to describe the systems to be modeled and help make the right decisions and partitions to tame complexity.

The ability to embrace conceptual modeling and interoperability techniques during systems specification and design presents a great advantage in distributed and hybrid simulation systems development efforts. Our research is aimed at the definition of a methodological framework that uses MBSE languages, methods and tools for the development of these simulation systems. A model-based composition approach is defined at the initial steps to identify distributed systems interoperability requirements and hybrid simulation systems characteristics. Guidelines are developed to adopt simulation interoperability standards and conceptual modeling techniques using MBSE methods and tools. Domain specific system complexity and behavior can be captured with model-based approaches during the system architecture and functional design requirements definition. MBSE can allow simulation engineers to formally model different aspects of a problem ranging from architectures to corresponding behavioral analysis, to functional decompositions and user requirements (Jobe, 2008).

Major: Industrial Engineering

Educational Career:
Bachelor’s of Electrical Engineering, BS, 1998, University of Central Florida
Master's of Industrial Engineering, MS, 2003, University of Central Florida

Committee in Charge:
Luis Rabelo, Chair, Industrial Engineering & Management Systems
Gene Lee, Industrial Engineering and Management Systems
Ahmad Elshennawy, Industrial Engineering and Management Systems
J. Peter Kincaid, Institute of Simulation and Training

Approved for distribution by Luis Rabelo, Committee Chair, on June 2, 2014.

The public is welcome to attend.