**Systems of Systems Engineering Collaborators Information Exchange (SoSECIE)**

**April 13, 2010 11:00AM to Noon ET**
**DeLaurentis & Suaser**

# Dynamic Modeling of Programmatic and Systematic Interdependence For System of Systems

**Dr. Daniel A. DeLaurentis**
Purdue University
And
**Dr. Brian Sauser**
Stevens Institute of Technology

**Abstract:**

The DoD emphasis on capability-based acquisition has led to the simultaneous development of systems that must eventually interact within a system-of-systems. Thus, system development and acquisition processes encounter interdependencies which generate complexity and risk. The presenters' prior research has a) developed a Computational Exploratory Model to simulate the development processes of these complex networks of systems intended for a system-of-systems capability, and b) has generated a metric for system maturity that includes integration risk. The goal in both is to understand the impact of system-specific risk and system interdependencies on the expected project development time. The joint presentation will describe use of the Model for quantification of risk propagation, of the impact of network topologies on the propagation, and of trade-offs amongst alternate configurations of constituent systems.

**Bio**

**Daniel DeLaurentis** is an Assistant Professor in the School of Aeronautics and Astronautics, Purdue University. He leads the System-of-Systems Laboratory and directs research sponsored by NASA, FAA, DoD, and Industry. His current research and teaching interests are in analytical and simulation models for the design of system-of systems, especially those for which air vehicles are a main element, as well as approaches for robust design, including robust control analogies and uncertainty modeling/management in multidisciplinary design. He has also been conducting research on the use of Serious Games and Virtual Worlds for learning engineering design. He received his Ph.D. from Georgia Institute of Technology in Aerospace Engineering in 1998.

**Brian Sauser** holds a B.S. from Texas A&M University in Agricultural Development with an emphasis in Horticulture Technology, a M.S. from Rutgers, The State University of New Jersey in Bioresource Engineering, and a Ph.D. from Stevens Institute of Technology in Project Management. He is currently an Assistant Professor in the School of Systems & Enterprises at Stevens Institute of Technology. Before joining Stevens in 2005, he spent more than 12 years working in government, industry, and academia both as a researcher/engineer and director of programs. His research interest is in the management of system lifecycle and evolution for development and acquisition. He is also the Director of the Systems Development and Maturity Laboratory at Stevens (http://www.systems-development-maturity.com).