16 New Research Tasks
17 Final Technical Reports
102 Faculty/84 Students
39 Journal & Conference Papers

- **Dan DeLaurentis**, and fellow authors at Purdue, received the 2016 INCOSE INSIGHT Best Paper Award.
- **Kristin Giammarco**, at NPS, received the Best Paper Award for Transition in Systems Engineering research at CSER 2017. (MITRE Award)
- **Jon Wade** and co-researchers at Stevens Institute of Technology and Georgia Tech received the Best Paper Award at the INCOSE IS.
• Bi-monthly webinars on key Systems Engineering topics

• Usually held **first Wednesday of even-numbered months**
  — 1–2 pm ET / 10—11 am PT (unless otherwise noted)

• Talks are available on the [SERC Talks page](#) and [SERC YouTube channel](#)

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**CONTACT**

Editor-in-Chief: Dr. Barry Boehm, University of Southern California

[boehm@usc.edu](mailto:boehm@usc.edu)

For general question or comments: Ms. Mimi Marcus at [mmarcus@stevens.edu](mailto:mmarcus@stevens.edu).
We need a new design perspective for socio-technical systems. Can Complex Network Perspective Be a Viable Candidate?
Babak Heydari, Stevens Institute of Technology
06.01.16

What Were the Top Issues and Opportunities from the SERC Model-Centric Design and Acquisition Forum?
Mark Blackburn and Megan Clifford on behalf of Dinesh Verma, Stevens Institute of Technology
08.03.2016

What Lives at the Intersection of MOSA and Set-Based Design?
Gary Witus, Wayne State
10.05.16

Why is Human-Model Interactivity Important to the Future of Model-Centric Systems Engineering?
Donna Rhodes & Adam Ross, MIT
12.07.16

What is the Self?
Grady Booch, IBM Research
02.01.17

Can Graphical Models Provide a Sufficient Basis for General Intelligence?
Paul S. Rosenbloom, University of Southern California
04.05.17

What Are Cyber-Social Learning Systems And How Will We Form Them?
Kevin Sullivan, University of Virginia
06.07.17

How Do We Prepare the People Who Will Need to Manage the Real-time Responses to Cyber Attacks on Physical Systems?
Barry Horowitz, University of Virginia
08.02.17

What are the Top Ten Software Security Flaws?
Gary McGraw, Synopsys
10.04.17

The Dilemmas of Cybersecurity – Why is Everything Broken?
William Scherlis, Institute for Software Research, Carnegie Mellon University
11.01.17 at 3PM ET
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*Note: Actual attendance is not reflective of multiple parties viewing from one session or those calling in only
SERC Talks: In Review

- Positive feedback: incorporation into working groups and classrooms
- “SERC Talks” videos have nearly 1,500 cumulative views currently
  - 10/12/2017: 1454 Total
- Average audience of all Talks:
  - Industry: 40.3%
  - Academia: 35.2%
  - Government: 16.5%
  - FFRDC: 8.0%
Registration Status: Oversubscribed
TENTATIVE AGENDA

Wednesday, December 6, 2017

8:30 Welcome

8:45 Introductory Remarks: Priorities with Regard to System Assurance (Security, Safety, Reliability) within a Digital Engineering/Acquisition Environment (Ms. Kristen Baldwin, DASD-Systems Engineering)

9:15 Featured Talk: Model-Based Development: What’s New? What’s Needed? (Professor Nancy Leveson, MIT)

10:00 Coffee Break

Government Perspective – Challenges and Opportunities with Enhancing System Assurance in a Digital Engineering Environment:

10:15 Challenges with Realizing Robust System Security in Complex Systems (Ms. Melinda Reed, Deputy Director, ODASD – Systems Engineering)

10:45 Challenges and Research Priorities with Digital Engineering as an Enabler for Trade Space Exploration/Systems Analysis (Ms. Philomena Zimmermann, Deputy Director, ODASD – Systems Engineering)

Industry Perspective – Challenges and Opportunities:

11:15 Hardening Legacy Systems and Cyber Resilient System Architectures (J. Thompson, Star Labs)
MANAGING ACQUISITION AND PROGRAM RISK

WORKSHOP
for GOVERNMENT, INDUSTRY & ACADEMIA

December 13, 2017

TENTATIVE AGENDA
Wednesday, December 13, 2017
8:00 Welcome (K. Delahay)
8:15 Scope, Background, and Process for the Workshop (P. Colling)
8:30 A position statement and a set of challenges on enhancing our ability to assess risks and make informed decisions in the face of risk (J. Thompson)
9:00 Finding and assessing risk – an insurance industry perspective (David Call, formerly of Det Norske Veritas)
9:30 Coffee Break
9:45 Breakout Sessions on Assessing and Communicating Risk
10:45 Debrief by Sorbes
11:00 Balancing risk and execution: a view from the investment community (Lou Shendberg, former CTO, ED Avantedge)
11:30 Working Lunch in Breakout Sessions on Balancing Risk and Opportunity
1:00 Debrief by Sorbes
1:15 Confronting Risks with Plans and Decisions (Hidde en Bouma)
1:45 Breakout Sessions on Risk Planning and Investment
2:45 Coffee Break
3:00 Debrief by Sorbes
3:15 Plenary Discussion on a path to the future in Risk Management
4:30 Collection of Research Topics
4:36 Rating Research Topics
4:56 Wrap-Up (Dinesh Verna)

ABSTRACT
Risk management in the context of systems engineering attempts to address two needs:

a) What issues should program managers pay particular attention to?

b) How should engineering and program decisions be made in the face of uncertainty?

While the standard risk management process does a fair job at the first need, this is often done at the expense of effectively dealing with uncertainty. This workshop will explore how the risk process might manage uncertainty better without compromising focus on the primary aspects of a program.

Risk management is an active area of research and practice in numerous domains outside of systems engineering. Whole industries, such as insurance, petroleum exploration, and pharmaceuticals, critically depend on effectively managing risk, and they invest in research on making strategic decisions in the face of uncertainty.

The purpose of the workshop will be to consider which aspects of acquisition and program risk management in the defense domain can benefit from focused research. Drawing on the rigorous probabilistic tools, and focusing on effective decision-making as the ultimate purpose of risk management, this workshop will map out a direction for improvement and attempt to articulate three to five research questions that should be addressed.

RESEARCH WORKSHOP LEADER:
Dr. Paul Colling
- Professor, University of Alabama (Huntsville)

SERC Executive Director:
Dr. Dinesh Verna
- Stevens Institute of Technology

SERC Chief Scientist:
Dr. Barry Boehm
- University of Southern California

To register, please visit:

PARTICIPATION IS LIMITED — REGISTER NOW.
Semantic Web Technologies Foundation for Systems Engineering – to enable Digital Engineering
SERC Research Thematic Areas

Enterprises and SoS
- Enterprise Analysis
- System of Systems Modeling and Analysis

Trusted Systems
- Systemic Security
- Systemic Assurance

Human Capital Development
- Evolving Body of Knowledge
- Experience Acceleration
- SE and Technical Leadership Education

SE & Systems Mgmt Transformation
- Affordability and Value in Systems
- Quantitative Risk
- Interactive Model-Centric Systems Engineering
- Agile Systems Engineering
Research Council Members

- **Enterprise Systems and Systems of Systems**
  - Dan DeLaurentis, Purdue
  - Bill Rouse, Stevens (NAE)

- **Human Capital Development**
  - Tom McDermott, GA Tech
  - Jon Wade, Stevens

- **Trusted Systems**
  - Barry Horowitz, UVA (NAE)
  - Kevin Sullivan, UVA

- **Systems Engineering and Systems Management Transformation**
  - Mark Blackburn, Stevens
  - Barry Boehm, USC (NAE)
  - Paul Collopy, UAH
SERC Doctoral Fellows Program

11 Doctoral Fellows
A Predictive Analysis Framework For Six Degrees Of Freedom Vibration Qualification, Davinia Rizzo, Sandia National Laboratories

Advisor: Dr. Mark Blackburn, Stevens Institute of Technology
SERC Founders Award - 2017
SSRR – Kickoff Keynote!