Resilience Week 2013

Transforming the Resilience of Cognitive, Cyber-physical Systems

August 13-15, 2013

Tuesday, August 13 - Tutorials & Workshops

7:30 a.m.	**Coffee and Registration** *(Grand Ballroom Foyer)*			
8:00 a.m.	**Opening Welcome:** Shankar Sastry, University of California, Berkeley *(Grand Ballroom)*			
8:15 a.m.	**Introductions and Logistics:** Jodi Grgich *(Grand Ballroom)*			
	CONTROL	**COGNITIVE**	**CYBER**	**COMMUNICATION**
8:30 a.m.	Keynote: Piero Bonissone, General Electric Global Research *(Mason I/II)*	Keynote: Kyle Hultgren, Center for Medication Safety Advancement *(Columbus I/II)*	Keynote: Vipin Swarup, MITRE *(Jackson)*	Open to attend keynotes
9:30 a.m.	**Morning Break**			
10:00 a.m.	**Control Session 1a:** *Mason I/II* / **Control Session 1b:** *Montgomery* — Cyber Security for Industrial Control Systems Chair: Frank Ferrese, NSWC	**Cognitive Session 1:** *Columbus I/II* Concepts and Processes of Resilient Cognitive Operations *(Columbus I/II)* Chair: Barrett Caldwell, Purdue University	**Cyber Session 1:** *Jackson* Cyber Resilience Theory Chair: Nick Multari, PNNL	**Communication Session 1:** *Pine* Learning from Disasters: Sandy, Communciations, and Manifold Resiliency Chair: Juan Deaton, INL
11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Norman Whitaker, DARPA *(Grand Ballroom)*			
1:00 p.m.	Test-Driven Development of Physics-Based Models Chair: Frank Ferrese, NSWC / ReSia Technical Committee Chairs: Milos Manic U of Idaho Craig Rieger, INL	Teams in Resilient Performance Settings Chair: Ron Boring, INL	Cyber Resilience Applications Chair: Marco Carvalho, Florida Institute of Technology	Resilience, Survivability and Disruption Tolerance for the Future Internet and Global Information Grid Chair: Juan Deaton, INL
2:30 p.m.	**Afternoon Break**			
3:00 p.m.	Resilient Consensus Control of Dynamic Systems Chair: Frank Ferrese, NSWC / ReSia Technical Committee (Cont.) Chairs: Milos Manic, Craig Rieger	History of Resilience Metrics Discussion Chair: Barrett Caldwell, Purdue University	Cyber Resilience Metrics Chair: Sean Peiser, UC Davis	Resilience, Survivability and Disruption Tolerance for the Future Internet and Global Information Grid (Cont.) Chair: Juan Deaton, INL
4:30 p.m.	**Adjourn**			

At-a-Glance

Wednesday, August 14 - Papers & Presentations

At-a-Glance

Time	CONTROL			COGNITIVE	CYBER		COMMUNICATION
7:30 a.m.	**Coffee and Registration** *(Grand Ballroom Foyer)*						
8:00 a.m.	**Opening Remarks and Daily Agenda:** Jodi Grgich *(Grand Ballroom)*						
8:30 a.m.	**Keynote:** Massoud Amin, University of Minnesota *(Mason I/II)*			**Keynote:** Stephen Rottler, Sandia National Laboratories *(Columbus I/II)*	**Keynote:** Thomas Longstaff, National Security Agency *(Jackson)*		**Keynote:** Rangam Subramanian, Idaho National Laboratory *(Pine)*
9:30 a.m.	**Morning Break**						
10:00 a.m.	**Control Session 1a:** *Mason I/II* Complex Networked Control Systems Chair: Chika Nwankpa, Drexel University	**Control Session 1b:** *Montgomery* Sensor Design / Networks Chair: Li Bai, Temple Uniersity	**Control Session 2:** *Washington* Mixed Initiative Response Chair: Zaruhi Mnatsakanyan, Johns Hopkins University	**Cognitive Session 1:** *Columbus I/II* Path to Autonomous, Resilient Systems Chair: David Woods, The Ohio State University	**Resilient Cyber Systems:** *Jackson* Chair: Marco Carvalho, FIT	**Systems Intelligence for Resilience:** *Sansome* Chair: Dipankar Dasgupta, Memphis University	**Communication Session 1:** *Pine* Efficient Resilient Communication in Error-prone Wireless Networks Chair: Juan Deaton, INL
11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Dane Egli, The Johns Hopkins University *(Grand Ballroom)* *Sponsored by* **TRUST, UC Berkeley**						
1:00 p.m.	Complex Networked Control Systems Chair: Chika Nwankpa, Drexel University	Data Fusion Chair: Jeff Bradshaw, Florida Institute for Human & Machine Cognition	Complex Networked Control Systems Chair: Frank Ferrese, NSWC	Path to Autonomous, Resilient Systems Chair: David Woods, The Ohio State University	Resilient Cyber Systems Chair: Marco Carvalho, FIT	Cyber Resilience Theory Chair: Nick Multari, PNNL	Communication Session 2 Chair: Juan Deaton, INL
2:30 p.m.	**Afternoon Break**						
3:00 p.m.	**Poster Session**				Resilient Cyber Systems Chair: Marco Carvalho, FIT	Cyber Resilience Theory Chair: Nick Multari, PNNL	
4:30 p.m.	**Adjourn**						
6:00 p.m.	**Hoster Dinner with Plenary Speaker** Declan Ganley, Rivada Networks *(The Dining Room)*						

Thursday, August 15 - Panel Discussions

7:30 a.m.	**Coffee and Registration** *(Grand Ballroom Foyer)*
8:00 a.m.	**Opening Remarks and Daily Agenda:** Jodi Grgich *(Grand Ballroom)*

	CONTROL	COGNITIVE	CYBER	COMMUNICATION
8:30 a.m.	**Keynote:** David Scheidt, Johns Hopkins University APL *(Mason I/II)*	Open to attend keynotes	**Keynote:** Doug Tygar, UC Berkeley *(Grand Ballroom)*	Open to attend keynotes

9:30 a.m.	**Morning Break**
10:00 a.m.	**Panel Discussion** - open to all attendees *(Grand Ballroom)*
	Moderator: Juan Deaton (Idaho National Laboratory)
	Declan Ganley (Rivada Networks), Dave Hutchison (Lancaster University),
	David Woods (Ohio State University), Li Bai (Temple University), Marco Carvalho (Florida Institute of Technology)
11:30 a.m.	**Concluding Remarks:** Craig Rieger, Idaho National Laboratory
11:40 a.m.	**Adjourn**
1:30 p.m.	**Tour -** UC Berkeley *(Optional)*
3:30 p.m.	**End of Tour**

At-a-Glance

Symposia: Control
Control Systems At-A-Glance

Tuesday, August 13 - Tutorials & Workshops

8:30 a.m.	**Keynote:** Piero Bonissone, General Electric Global Research *(Mason I/II)*	
9:30 a.m.	**Morning Break**	
10:00 a.m.	**Control Session 1a:** *Mason I/II* Chair: Frank Ferrese, US Navy NAVSEA	**Control Session 1b:** *Montgomery*
	Cyber Security for Industrial Control Systems - Wayne Cantrell, Siemens Corporation	Open
11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Norman Whitaker, DARPA *(Grand Ballroom)*	
1:00 p.m.	Test-driven Development of Physics-based **Models -** Damian Rouson, Sourcery, Inc.	ReSia Technical Committee Chairs: Milos Manic, U of I and Craig Rieger, INL
2:30 p.m.	**Afternoon Break**	
3:00 p.m.	Resilient Consensus Control of Dynamic Systems - Saroj Biswas, Temple University	ReSia cont.
4:30 p.m.	**Adjourn**	

Wednesday, August 14 - Papers & Presentations

8:30 a.m.	**Keynote:** Massoud Amin, University of Minnesota *(Mason I/II)*		
9:30 a.m.	**Morning Break**		
	Complex Networked Control Systems: *Mason I/II* Chair: Chika Nwankpa, Drexel University	**Sensor Design / Networks:** *Montgomery* Chair: Li Bai, Temple University	**Mixed Initiative Response:** *Washington* Chair: Zaruhi Mnatsakanyan, Johns Hopkins University
10:00 a.m.	Infrastructure Resilience Using Cyber-Physical Game Theoretic Approach - Nageswara Rao, ORNL	Resilient Monitoring System for Boiler/Turbine Plant - Seymon Meerkov, University of Michigan	Non-Destructive State Machine Reverse Engineering - Jessica Smith, PNNL
10:30 a.m.	A Mathematical Framework for the Analysis of Cyber-Resilient Control Systems - Alexander Melin, ORNL		A Micro-Grid Simulator Tool (SGridSim) using Effective Node-to-Node Complex Impedance (EN2NCI) Models - Udhay Ravishankar, U of I

11:00 a.m.	Multi-Objective Consensus of Interconnected System of Multi-Agent Systems - Saroj Biswas, Temple University	Inclusion of Game-Theoretic Formulations for Resilient Condition Assessment Monitoring - Humberto Garcia, INL	
11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Dane Egli, The Johns Hopkins University *(Grand Ballroom) Sponsored by* **TRUST, UC Berkeley**		
	Complex Networked Control Systems Chair: Chika Nwankpa, Drexel University	Data Fusion Chair: Jeff Bradshaw, Florida Institute for Human & Machine Cognition	Complex Networked Control Systems Chair: Frank Ferrese, NSWC
1:00 p.m.	On Analysis and Design of Stealth-Resiliant Control Systems - Shaunak Bopardikar, UTRC	Computational Intelligence Based Data Fusion Algorithm for Dynamic sEMG and Skeletal Muscle Force Modelling - Chandrasekhar Potluri, ISU	Resilient Control of Cyber-Physical Systems against Denial-of-Service Attacks - Yuan Yuan, Tsinghua University
1:30 p.m.	Distributed Fuzzy Logic Price Negotiation in Market Based Mutli-agent Control - Li Bai, Temple University	Fuzzy Linguistic Knowledge Based Behavior Extraction for Building Energy Management Systems - Dumidu Wijayasekara, U of I	Variations of Converter's Control Parameters and its Effects on DC Multi-Converter Power Systems - Chika Nwankpa, Drexel
2:00 p.m.	A Hierarchical Multi-Agent Dynamical System Architecture for Resilient Control Systems - Quanyan Zhu, U. Illinois, UC		
2:30 p.m.	**Afternoon Break**		
3:00 p.m.	**Poster Session**		
4:30 p.m.	**Adjourn**		
6:00 p.m.	**Hoster Dinner with Plenary Speaker:** Declan Ganley, Rivada Networks *(The Dining Room)*		

Thursday, August 15 - Panel Discussions

8:30 a.m.	**Keynote:** David Scheidt, Johns Hopkins University APL *(Mason I/II)*
10:00 a.m.	**Panel Discussion** - open to all attendees *(Grand Ballroom)*
1:30 p.m.	**Tour -** UC Berkeley *(Optional)*

Symposia: Cognitive
Cognitive Systems At-A-Glance

Tuesday, August 13 - Papers & Presentations

8:30 a.m.	**Keynote:** Kyle Hultgren, Center for Medication Safety Advancement *(Columbus I/II)*
9:30 a.m.	**Morning Break**
	Cognitive Session 1: *Columbus I/II* Concepts and Processes of Resilient Cognitive Operations Chair: Barrett Caldwell, Purdue University
10:00 a.m.	**Is Performance Variability Necessary? A Qualitative Study on Cognitive Resilience in Forestry Work** - Jennifer Colman and Heather Kahle, WorkSafeBC
10:30 a.m.	**Considering Quantitative Metrics for Resilience** - Barrett Caldwell, Purdue University
11:00 a.m.	**Process for Control Room Modernization Using Digital Control Systems at Nuclear Power Plants** - Ron Boring, Idaho National Laboratory
11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Norman Whitaker, DARPA *(Grand Ballroom)*
	Teams in Resilient Performance Settings Chair: Ron Boring, Idaho National Laboratory
1:00 p.m.	**Resilience in Robot-Assisted Surgical Teams** - E. Asher Balkin , The Ohio State University
1:30 p.m.	**Robust Flight Deck Systems: Harnessing the Synergistic Power of the Crew** - Mike Stasio, United Airlines
2:00 p.m.	**Differences in Trust Between Two Types of Alarms and Events within a Nuclear Plant and Control Simulation** - Ron Boring, Idaho National Laboratory
2:30 p.m.	**Afternoon Break**
3:00 p.m.	**Quantitative Modeling of Social Systems Dynamics and Resilience Prior to 1990: Lessons for Today** - Barrett Caldwell, Purdue University
4:30 p.m.	**Adjourn**

Wednesday, August 14 - Tutorials & Workshops

8:30 a.m.	**Keynote:** Stephen Rottler, Sandia National Laboratories *(Columbus I/II)*
9:30 a.m.	**Morning Break**
10:00 a.m.	**Cognitive Session 1:** *Columbus I/II* Chair: David Woods, The Ohio State University
	Path to Autonomous, Resilient Systems - John Doyle, Caltech David Woods, The Ohio State University
11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Dane Egli, The Johns Hopkins University *(Grand Ballroom) Sponsored by* **TRUST, UC Berkeley**
1:00 p.m.	**Path to Autonomous, Resilient Systems** - Doyle/Woods cont.
2:30 p.m.	**Afternoon Break**
3:00 p.m.	**Poster Session**
4:30 p.m.	**Adjourn**
6:00 p.m.	**Hoster Dinner with Plenary Speaker:** Declan Ganley, Rivada Networks *(The Dining Room)*

Thursday, August 15 - Panel Discussions

10:00 a.m.	**Panel Discussion** - open to all attendees *(Grand Ballroom)*
1:30 p.m.	**Tour -** UC Berkeley *(Optional)*

Symposia: Cyber Systems
Cyber Systems At-A-Glance

Tuesday, August 13 - Tutorials & Workshops

8:30 a.m.	**Keynote:** Vipin Swarup, MITRE *(Jackson)*
9:30 a.m.	**Morning Break**
10:00 a.m.	**Cyber Session 1:** *Jackson* Chair: Marco Carvalho, Florida Institute of Technology
	Cyber Resilience Theory - Nick Multari and Chris Oehmen, Pacific Northwest National Laboratory
11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Norman Whitaker, DARPA *(Grand Ballroom)*
1:00 p.m.	Cyber Resilience Frameworks and Applications - Deb Bodeau, MITRE
2:30 p.m.	**Afternoon Break**
3:00 p.m.	Cyber Resilience Metrics - Marco Carvalho, Florida Institute of Technology and Sean Peisert, UC Davis
4:30 p.m.	**Adjourn**

Wednesday, August 14 - Papers & Presentations

8:30 a.m.	**Keynote:** Thomas Longstaff, National Security Agency *(Jackson)*	
9:30 a.m.	**Morning Break**	
	Resilient Cyber Systems: *Jackson* Chair: Marco Carvalho, Florida Institute of Technology	**Systems Intelligence for Resilience:** *Sansome* Chair: Dipankar Dasgupta, University of Memphis
10:00 a.m.	The language of behavior: Exploring a new formalism for resilient response - Glenn Fink, PNNL	Information Security Analysis for CKMS Using Game Theory and Simulation - Rick Sheldon, ORNL
10:30 a.m.	Towards Improved Detection of Attackers in Computer Networks: New Edges, Fast Updating, and Host Agents - John Neil, LANL	Modeling and Cyber Security Vulnerabilities Analyzing for Smart Grid Transmission Subsystem - Yi Deng, Virginia Tech
11:00 a.m.	A Command and Control Framework for Moving Target Defense and Cyber Resilience - Marco Carvalho, FIT	Adaptive Selection of Multi-Factor Modalities for Continuous Authentication - Dipankar Dasgupta- University of Memphis

11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Dane Egli, The Johns Hopkins University *(Grand Ballroom) Sponsored by* **TRUST, UC Berkeley**	
	Resilient Cyber Systems *(Jackson)* Chair: Marco Carvalho, FIT	Cyber Resilience Theory *(Sansome)* Chair: Nick Multari, PNNL
1:00 p.m.	Statistical detection of malicious web sites through time proximity to existing detection events - Alexander Kent, LANL	Supply Chain Integration for Integrity: Policy and architecture for built-in supply chain integrity of trusted components - Rick Sheldon, ORNL
1:30 p.m.	Scalable Machine Learning Framework for Behavior-Based Access Control - Michael Atighetchi, Raytheon BNN Tech.	Increasing Cyber System Resilience Through Predictability-Based Defense - Rich Colbaugh, Sandia National Laboratory
2:00 p.m.	A Combined Discriminative and Generative Behavior Model for Cyber Physical System Defense - Owen McCusker, Sonalysts, Inc.	Metrics and Analysis Techniques for Cyber Defensibility, Resiliency, and Security: Looking Across Different Evaluation Environments - Bill Heinbockel, MITRE
2:30 p.m.	**Afternoon Break**	
3:00 p.m.	Simulation Tool for Evaluation and Design of Resilience Strategies - Dung Lam, University of Texas, Austin	Towards a Unified Theoretical Framework for Reconstitution of Cyber Systems - Mahantesh Halappanavar, PNNL
	Cooperation Models Between Humans and Artificial Self-Organizing Systems: motivations, issues, and perspectives - Gabriel Rey, PUJ	Measuring Success in Complex System Models using Formal Concept Analysis and Probability Models - Jennifer Davidson, Iowa State
4:00 p.m.	**Poster Session**	
4:30 p.m.	**Adjourn**	
6:00 p.m.	**Hoster Dinner with Plenary Speaker:** Declan Ganley, Rivada Networks *(The Dining Room)*	

Thursday, August 15 - Panel Discussions

8:30 a.m.	**Keynote:** Doug Tygar, UC Berkeley *(Grand Ballroom)*
10:00 a.m.	**Panel Discussion** - open to all attendees *(Grand Ballroom)*
1:30 p.m.	**Tour -** UC Berkeley *(Optional)*

Symposia- Communications
Communication Systems At-A-Glance

Tuesday, August 13 - Tutorials & Workshops

8:30 a.m.	Open to attend keynotes
9:30 a.m.	**Morning Break**
10:00 a.m.	**Communication Tutorials:** *Pine* Chair: Juan Deaton, Idaho National Laboratory
	Learning form Disasters: Sandy, Communications, and Manifold Resiliency - Lee Vinsel, Steven Institute
11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Norman Whitaker, DARPA *(Grand Ballroom)*
1:00 p.m.	**Resilience, Survivability, and Disruption Tolerance for the Future Internet and Global Information Grid** - James Sterbenz, University of Kansas
2:30 p.m.	**Afternoon Break**
3:00 p.m.	James Sterbenz cont.
4:30 p.m.	**Adjourn**

Wednesday, August 14 - Papers & Presentations

8:30 a.m.	**Keynote:** Rangam Subramanian, Idaho National Laboratory *(Pine)*
9:30 a.m.	**Morning Break**
10:00 a.m.	**Communication Session 1:** *Pine* Chair: Juan Deaton, Idaho National Laboratory
	Efficient and Resilient Communication in Error-prone Wireless Networks - Jie Wu, Temple University
11:30 a.m.	**Hosted Lunch with Plenary Speaker:** Dane Egli, The Johns Hopkins University *(Grand Ballroom) Sponsored by* **TRUST, UC Berkeley**
1:00 p.m.	**Communication Session 2** Space-polarization MIMO Testbed - Jun Chen, University of Notre Dame
1:30 p.m.	Throughput and Fairness-Aware Dynamic Network Coding in Wireless Communication Networks - Pouya Ostovari , Temple University
2:30 p.m.	**Afternoon Break**
3:00 p.m.	**Poster Session**
4:30 p.m.	**Adjourn**
6:00 p.m.	**Hoster Dinner with Plenary Speaker:** Declan Ganley, Rivada Networks *(The Dining Room)*

Thursday, August 15 - Panel Discussions

10:00 a.m.	**Panel Discussion** - open to all attendees *(Grand Ballroom)*
1:30 p.m.	**Tour -** UC Berkeley *(Optional)*