

# Resilience Week 2016 Program



Tuesday, August 16

Time	Resilience Models and Measures [Rosewood] Chairs: Michael Haney, UI; Michael Atighetchi, BBN	Avoiding Skynet— Humans Interacting with Autonomy [Redwood] Chairs: David Scheidt, Julie Marble, JHU APL	Resilient Infrastructure [Cypress] Chairs: David Alderson, NPS; Cherrie Black, INL
7:00	<b>Registration</b> [Atrium]		
8:00	<b>Symposium Opening Plenary:</b> RADM (ret) Bill Leigher, Raytheon Company [Regency Ballroom]		
8:20	<b>Welcome and Announcements</b> [Regency Ballroom]		
8:30	<b>Keynote:</b> Matt Bishop, University of California-Davis	<i>Human-Autonomous System Collaboration</i> , Denise Nicholson, Soartech	<b>Welcome:</b> David Alderson and Cherrie Black <b>Intro to CIRI:</b> David Nicol, CIRI PI, University of Illinois <b>Keynote:</b> Bob Kolasky, DHS, NPPD-IP
9:00		William Lawless, Paine College	
9:30	<b>Keynote:</b> Greg Shannon, Office of Science and Technology Policy	<b>Keynote:</b> Kris Kearns, Air Force Research Laboratory	<b>CIRI Panel: Needs and Objectives for Resiliency in Critical Infrastructure</b> <b>Moderator:</b> Mark Petri, Director CIRI <ul style="list-style-type: none"> <li>o Jeff Binder, CIRI Acting Director</li> <li>o Charles Rath, Resilient Solutions 21, CIRI External Advisory Board</li> <li>o Chick Macal, Argonne National Laboratory</li> <li>o Steve Flynn, Northeastern University</li> </ul>
10:30	<b>Morning Break</b> [Atrium]		
11:00	Milos Manic, VCU	<i>The Human Should be Part of the Control Loop?</i> , R. Robinson, ARL	<b>CIRI Panel: Risk Assessment</b> <b>Moderator:</b> Chick Macal, Argonne National Laboratory <ul style="list-style-type: none"> <li>o Santanu Chaudhuri, University of Illinois</li> <li>o Ryan Hruska, Idaho National Laboratory</li> <li>o David Brannegan, Argonne National Laboratory</li> <li>o Jay Kesan, University of Illinois</li> </ul>
11:30	<i>Challenges and future directions in cyber defense quantification</i> , Jason Syversen, Siege Technologies	<i>Resilient Autonomous Systems: Challenges and Solutions</i> , G. Matthews, UCF	
12:00	<b>Hosted Lunch with Plenary</b> [Regency Ballroom] Dominique Luzeaux, Deputy Director of the Joint Directorate for Networks, Infrastructure and Information Systems, EMA/DIRISI		
1:30	<b>Keynote:</b> Osama A. Mohammed, Florida International University	Jennifer McKneely, JHU/APL	<b>Student Competition: Lightning Talks</b> <ul style="list-style-type: none"> <li>o <i>Human in the Loop Design and Optimization for Resilient Infrastructure Networks</i>, Ulsan</li> <li>o <i>Urban flooding forecast for Phoenix roadways under increasing precipitation</i>, Kim</li> <li>o <i>Automated extraction of dynamic parameters of infrastructure by video motion magnification and unsupervised machine learning</i>, Dorn</li> <li>o <i>A Networks Perspective of Air Traffic Delays</i>, K. Gopalakrishnan</li> <li>o <i>Toward Mission-centric Vulnerability Analysis for Critical Systems: Methodology and Approach</i>, Bakirtzis</li> <li>o <i>Algorithm for Probabilistic Modeling of Interdependent Critical Infrastructure Systems</i>, Johansen</li> <li>o <i>Stress-Strain Capacity Analysis for Robust Infrastructure Service during Post Disaster Recovery</i>, Choi</li> <li>o <i>Vulnerability of Urban Water Systems to Climate Change and Mitigating the Potential for Cascading Failures</i>, Bondank</li> <li>o <i>Interdiction Analysis of a Coupled Electricity and Gas Network</i>, Hua</li> <li>o <i>Simulating Failure for Student Success</i>, McBurnett</li> <li>o <i>Bridging sociotechnical networks for critical infrastructure resilience: South Korean Case Study</i>, Eisenberg</li> </ul>
2:00		Kaleb McDowell, ARL	
2:30	Tim McJunkin, INL	<b>Keynote:</b> David Bruemmer, 5D Robotics	
3:00	Xinming Ou, USF		
3:30	<b>Reception and Poster Session</b> [Atrium]		
6:00	<b>Adjourn for Day</b>		

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7:30	Registration [Atrium]			
8:20	Announcements [Regency Ballroom]			
8:30	Keynote: Trung Tran, DARPA [Regency Ballroom]			<b>CIRI Projects</b> <b>Moderator:</b> David Nicol, CIRI PI <ul style="list-style-type: none"> <li>Resilience Governance, Steve Flynn, NEU</li> <li>Measuring Business and Economic Resilience in Disasters, Adam Rose, USC</li> <li>Scenario-Based Flood Risk Mapping, Himanshu Grover, UW</li> <li>Advancing Resiliency in Critical Power and Industrial Controls Infrastructure, Mark Harral, Texas Tech</li> <li>Resilience in the Manufacturing Sector through Digital Threading, Bill King, UI</li> <li>Analyzing the Cyber-insurance market as a Market-Based Solution for Cyber Resiliency, Sachin Shetty, TSU</li> </ul>
	<b>Cyber for Power Sector</b>	<b>Control for Power Sector</b>	<b>Cognitive Interface Papers</b>	
9:30	Vulnerabilities in Two-Area Automatic Generation Control Systems Under Cyberattack, S. Biswas, Temple U	*Testbed-based Performance Evaluation of Attack-Resilient Control for AGC, D. McKinnon, PNNL	A Graphic Form with Emergent Properties for Monitoring Renewable Generation Stations, G. Jamieson, UT	
10:00	*Survivability Analysis and Recovery Support for Smart Grids, S. Sarvestani, MST	Improving Transmission System Resilience Using an Automation Controller and Distributed Resources, P. Penkey, UI	System-Task Analytical Framework for Monitor Assessment, N. Lau, VT	
10:30	Morning Break [Atrium]			
	<b>Cyber Deception</b>	<b>Control for Power Sector</b>	<b>Cognitive Modeling</b>	An Overview of the NIST Center of Excellence for Risk-Based Community Resilience Planning, Paolo Gardoni, NIST Center for Risk-Based Community Resilience Planning
11:00	Dynamic Application Rotation Environment for Moving Target Defense, M. Thompson, ANL	Energy Saving in Microgrid with Tree Configurations Using Nash Bargaining Solution, Q. Ren, Temple	Social Network Analysis for Assessing Research Team Collaboration and Implementation Capacity, J. Helbing, UI	
11:30	Enabling Defensive Deception in Distributed System Environments, N. Soule, BBN	Measurement Sensitivity Analysis of Information Embedded Power Systems using ABCD Matrices, T. Lakins, Drexel	State Modeling to Identify Critical Situations, S. Landry, Purdue	
12:00	Hosted Lunch with Plenary and Honorary General Chair: Massoud Amin, Director of TLI, University of Minnesota [Regency Ballroom]			
1:30	Keynote: Nitin Vaidya, University of Illinois Urbana-Champaign [Regency Ballroom]			<b>RRAP Discussion</b> <ul style="list-style-type: none"> <li>Dan Genua, DHS</li> <li>Will McNamara, DHS</li> <li>Russ Bowman, Coast Guard Academy</li> </ul>
2:00				
	<b>Asymmetric Cyber Resilience</b>	<b>Attack Detection/Verification</b>	<b>Communications Resilience</b>	<b>RRAP – Next Gen Panel Discussion</b> <b>Chair:</b> Cherrie Black <ul style="list-style-type: none"> <li>Dan Genua, DHS</li> <li>Will McNamara, DHS</li> <li>Panelists TBD</li> </ul>
2:30	Chris Oeman, PNNL	Detecting PLC Control Corruption via On-Device Runtime Verification, L. Garcia, Rutgers	Internet Resilience in Ashburn, Virginia, M. Thompson, ANL	
3:00		Recovery after Attacks of Deception on Networked Control Systems, K. Kiriakidis, USNA	Evaluation of Anomaly Detection Techniques for SCADA Communication Resilience, S. Shirazi, Lancaster	
3:30	Afternoon Break [Atrium]			
	<b>Cyber Operations/Defense</b>	<b>Disturbance Rejection and Cyber Resilience</b>		<b>Invited Panel:</b> <b>Owner / Operators Addressing Risk &amp; Resilience</b> <b>Moderators:</b> John Walsh, FEMA; Cherrie Black, INL
4:00	Progressive Recovery of Interdependent Services in Enterprise Data Centers, I. El-Shekeil, Temple	Vulnerability of Fixed-Time Control of Signalized Intersections to Cyber-Tampering, A. Ghafouri, Vanderbilt		

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4:30	<i>Adapting Level of Detail in User Interfaces for Cybersecurity Operations, C. Inibhunu, Uncharted Software</i>	<i>An H-infinity Approach to Stealth-resilient Control Design, S. Bopardikar, UTRC</i>		<b>Panelists:</b> <ul style="list-style-type: none"> <li>○ Michael Carano, ChicagoFIRST</li> <li>○ Ralph Chiczewski City of Chicago, Dept. of Water</li> <li>○ Reed Dring, Stickney Water, Metropolitan Water Reclamation District of Greater Chicago</li> <li>○ Cheryl Maletich, Commonwealth Edison Company</li> <li>○ Alicia Tate-Nadeau, Chicago Office of Emergency Mgmt &amp; Communications</li> </ul>
5:00	<i>A Decision Engine for Configuration of Proactive Defenses - Challenges and Concepts, M. Atighetchi, BBN</i>	<i>Performance Evaluation of Secure Industrial Control System Design: A Railway Control System Case Study, X. Koutsoukos, Vanderbilt</i>		
5:30	<b>Adjourn Meetings</b>			
6:00	<b>Networking Reception at TopGolf, 3211 Odyssey Ct</b>			
7:30	<b>Adjourn for Day</b>			

\* Best Papers

## Thursday, August 18

Time	Cyber Resilience Track [Aspen] <i>Chairs: Frank Ferrese; NAVSEA, Michael Haney, UI; Craig Rieger, INL</i>	Research and Efforts in the Human Dimension [Cypress] <i>Chairs: Phil Bennett, SNL; Roger Lew, UI; Nathan Lau, VT</i>	Resilient Infrastructure <i>Chairs: John Hummel, Paul Lewis, Frederic Petit, ANL</i>	
			Lighting Talks: Track 1 [Redwood]	Lightning Talks: Track 2 [Rosewood]
8:00	<b>Registration [Atrium]</b>			
8:20	<b>Announcements [Regency Ballroom]</b>			
8:30	<b>Keynote:</b> Alexander Dolpp, Mercedes-Benz Research & Development	<b>Track Overview:</b> Phil Bennett and Roger Lew  <ul style="list-style-type: none"> <li>○ Resiliency is a Wicked Problem, Sydelko, ANL</li> <li>○ Striving to achieve resilience across social, environmental, and technical systems: Research and analyses at Oak Ridge National Laboratory, Wolfe, ORNL</li> <li>○ Using a Dynamic Modeling Approach to Understanding Resilience, Martinez-Moyano, ANL</li> <li>○ Applying Organizational Change Theory to Increase Cyber Resilience, Mylrea, PNNL</li> <li>○ Integrating narrative into engineering decision making, Mackenzie, Ames</li> <li>○ A Brief Survey of Methods to Analyze Human Decisions for Infrastructure Resilience Applications, North, ANL</li> </ul>	<b>Restoration/Recovery</b> <ul style="list-style-type: none"> <li>○ A Node Split-Recovery Model for Congestion Evolution Process on Road, Ukkusuri, Purdue</li> <li>○ Remote Sensing Decision Support System for Optimal Access Restoration in Post Disaster Environments, Aros-Vera, RPI/RIT</li> <li>○ Probabilistic Risk Analysis of Hurricane Impacts at Distribution Network Resolution, Backhaus, LANL</li> <li>○ Repair, Rebuild, or Replace? Protecting Aging Infrastructure From Hazards and Threats, Alderson, NPS</li> <li>○ Energy Infrastructure Interdependency Training to Enhance System Operator Situational Awareness and Improve Restoration Response, Kavicky, ANL</li> </ul>	<b>Cyber-Physical</b> <ul style="list-style-type: none"> <li>○ Cyber Physical Regional Resilience, Stanchfield, MITRE</li> <li>○ Enhancing Power Grid Cybersecurity to Improve Critical Electric Infrastructure Resilience, Qi, ANL</li> <li>○ Cyber-Physical Models for Critical Infrastructure Security Analysis, Weaver, UIUC</li> <li>○ ICS-CAPE : Industrial Control Systems – Cyber Attacks and their Physical Effects, Klett, INL</li> <li>○ Power Grid Resilience, Qiu, ANL</li> </ul>
9:30			<b>Keynote:</b> Kevin Staggs, Honeywell CSTC	<b>Regional/Community/Human Resilience</b> <ul style="list-style-type: none"> <li>○ Leapfrogging: Use of community sustainability initiatives to inform community resilience efforts, Schneider, RIT</li> <li>○ Critical Infrastructure Dependencies &amp; Community Resilience, Hruska, INL</li> <li>○ The Perils of Efficiency: Impacts of an Unplanned Closure of the Soo Locks, Orr, DHS</li> <li>○ Framework for State Energy Resilience, Phillips, ANL</li> </ul>

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			Lighting Talks: Track 1 [Redwood]	Lightning Talks: Track 2 [Rosewood]
10:30	<b>Morning Break</b> [Atrium]			
11:00	<b>Keynote:</b> Annabelle Lee, EPRI	<ul style="list-style-type: none"> <li>○ <i>Incorporating Human Readiness Levels at Sandia National Laboratories</i>, See, SNL</li> <li>○ <i>Computational Modeling of Visual Search Behavior</i>, Yoon, ORNL</li> <li>○ <i>To Err is Human: How Automation of the Grid is Impacting Operator Performance and System Resilience</i>, Burnham, SNL</li> <li>○ <i>Human dimensions of infrastructure interdependency and resilience</i>, Graziano, ANL</li> </ul>	<p style="text-align: center;"><b>Climate/Heat/Water</b></p> <ul style="list-style-type: none"> <li>○ <i>Growing Investor Awareness of Climate Risk</i>, Coffee, CRC</li> <li>○ <i>Climate Change and the Wastewater Sector</i>, Finster, ANL</li> <li>○ <i>Toward a More Resilient Wastewater Treatment Infrastructure and Operations</i>, Urgun-Demitras, ANL</li> <li>○ <i>The Vulnerability of Interdependent Urban Infrastructure Systems to Extreme Heat</i>, Clark, ASU</li> <li>○ <i>Climate Change and Infrastructure Adaptation</i>, Wall, ANL</li> <li>○ <i>Power Grid Resilience</i>, Qiu, ANL</li> <li>○ <i>Front-Line Resilience Perspectives: The Electric Grid</i>, Finster, ANL</li> </ul>	<p style="text-align: center;"><b>Interdependence / Interconnectedness</b></p> <ul style="list-style-type: none"> <li>○ <i>SimDependency: A Dependency Mapping and Consequence Tool</i>, Thompson, ANL</li> <li>○ <i>Interconnectedness and Interdependencies of Critical Infrastructures: Implications for Resilience in the U.S. Economy</i>, Chopra, UI</li> <li>○ <i>Interdependent Critical Infrastructure (CI) Sector Analysis for the Emergency Management Mission</i>, Flanigan, JHU/APL</li> <li>○ <i>Strategic Solutions for High-Density and Interdependency Visualization</i>, Edsall, INL</li> <li>○ <i>Critical Infrastructure Dependency Analysis: DHS Infrastructure Dependencies</i>, T. Klett, INL</li> </ul>
12:00	<b>Hosted Lunch with Plenary Speaker:</b> Brian Pierce, Director DARPA, I2O [Regency Ballroom]			
1:30	<b>Keynote:</b> Cynthia Hsu, NRECA	<ul style="list-style-type: none"> <li>○ <i>Digital Cancer Surveillance</i>, Tourassi, ORNL</li> <li>○ <i>Human-Machine Interface Research at the Los Alamos National Laboratory Engineering Institute</i>, Mascareñas, LANL</li> <li>○ <i>Real-time data collection through wearable devices to quantify attributes related to health and performance in extreme conditions</i>, Aviña, SNL</li> <li>○ <i>The Driver's Missing Windshield: Enabling the Operator's Forward View Through Predictive Displays for Process Control</i>, Lew, INL</li> <li>○ <i>Rice</i>, PNNL</li> <li>○ <i>An Overview of the Ames Lab Simulation, Modeling and Decision Science Program</i>, Bryden, Ames</li> </ul>	<p><b>Track Summary and Roundtable: Future Planning</b></p> <p><b>Facilitators:</b> David Alderson and Cherrie Black</p>	
2:30	<b>Panel: Cyber Resilience R&amp;D Perspectives</b> <b>Moderator: Michael Haney, UI</b>			
3:30		<p><b>Track Summary, Roundtable Introduction and Discussion:</b> Phil Bennett</p>		
5:00	<b>Adjourn Conference</b>			

