



Safe and Secure Systems and Software Symposium(S5)



As of 2254EDT, 24 July 2016

Day 1	S5 Agenda – Tuesday, 12 July 2016
0730-0800	Check-in
0800-0805	Welcome and Administrative Remarks
0805-0845	 Keynote: Drone Avionics Architecture: Challenges and a Solution Approach <i>Dr. Lui Sha, University of Illinois at Urbana-Champaign</i>
0845-0905	Topic Area Overview & Motivation <i>Dr. Stanley Bak, AFRL/RQQA VVCAS Team</i>
0905-0935	A Framework for Evidence-Based Licensure of Autonomous Systems <i>Dr. David Tate, Institute for Defense Analyses</i>
0935-1005	Domain Arguments: Experts Have a Point <i>Dr. Jonathan Rowanhill, Dependable Computing</i>
1005-1035	BREAK ☕ (30 min)
1035-1105	Reasoning About Uncertainty And Confidence in Assurance Cases: A Preliminary Case Study with the NASA AOS Project <i>Ms. Lian Duan, University of Minnesota</i>
1105-1135	Towards a Framework for Practical Assurance Argument Composition <i>Dr. Benjamin Rodes, Dependable Computing</i>
1135-1205	Quantifying Confidence in Assurance Arguments: Some Skepticism is Warranted <i>Dr. Patrick John Graydon, NASA Langley Research Center</i>
1205-1335	LUNCH 🍴🍷 (on your own)
1335-1405	A Simplex Architecture for Intelligent and Safe Unmanned Aerial Vehicles <i>Dr. Heechul Yun, University of Kansas</i>
1405-1435	Safe Testing and Execution of Autonomy in Complex, Interactive Environments <i>Dr. David Scheidt, Johns Hopkins University's Applied Physics Lab</i>
1435-1505	Build a Safety Case Argument for Complex Autonomy with Runtime Assurance <i>Dr. John Schierman, Barron Associates</i>
1505-1535	BREAK ☕ (30 min)
1535-1605	Detecting Undesirable Emergent Behavior in Teams of Autonomous UASs <i>Dr. Paul Kogut, Lockheed Martin</i>
1605-1635	Integration of Quantifier Eliminator with Model Checker and Compositional Reasoner <i>Dr. Ratnesh Kumar, Iowa State University</i>
1635-1705	Combinatorial Methods for Detecting Rare Faults <i>Mr. Rick Kuhn, National Institute of Standards and Technology [NIST]</i>
1705-1705	Closing Remarks



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Day 2		S5 Agenda – Wednesday, 13 July 2016	
0730-0800	Sign-in at Registration Desk and Poster Setup in Salon C&D		
0800-0805	Welcome and Administrative Remarks		
0805-0845	 Keynote: Reducing the Cost of V&V for Flight Critical Systems <i>Dr. Guillaume Brat, NASA Ames</i>		
0845-0915	Safety Critical Software and Systems V&V Research at General Electric <i>Mr. Michael Durling, General Electric Global Research</i>		
0915-0945	Reachable Set Computation for Cyber-Physical Systems Using Flow* <i>Dr. Xin Chen, University of Colorado</i>		
0945-1015	An Example Set of Cyber-Physical V&V Challenges for S5 <i>Mr. Chris Elliott, Lockheed Martin Skunk Works</i>		
1015-1030	BREAK ☕ (15 min)		
1030-1130	Poster Session <i>Salon C & D</i>		
1130-1300	LUNCH 🍴 (on your own)		
1300-1330	Verifying Cyber-Physical Systems by Combining Software Model Checking with Hybrid Systems Reachability <i>Dr. Sagar Chaki, Carnegie Mellon Software Engineering Institute(SEI)</i>		
1330-1400	Formal Verification of Intelligent Decision Procedures Systems Modeled as Decision Procedures <i>Dr. Siddhartha Bhattacharyya, Florida Institute of Technology</i>		
1400-1430	An Engineering Methodology for Assessing Cybersecurity Threats and Risk to DoD Weapon Systems <i>Mr. Harrell VanNorman, US Air Force Avionics Cybersecurity Tech Expert</i>		
1430-1500	Construction and Implementation of CERT Secure Coding Rules Improving Automation of Secure Coding <i>Dr. Mark Sherman, Carnegie Mellon Software Engineering Institute(SEI)</i>		
1500-1530	BREAK ☕ (30 min)		
1530-1600	A Mathematical Theory of Human Machine Teaming <i>Dr. Pete Trautman, Galois, Inc.</i>		
1600-1630	Verification of Security Response <i>Dr. Thomas C. Eskridge, Florida Institute of Technology</i>		
1630-1700	Mission Planning Framework for Manned-Unmanned Teams <i>Dr. Mauricio Castillo-Effen, GE Global Research Center</i>		
1700-1700	Closing Remarks		
1730-1930	No-Host Social – WarpedWing <i>(26 Wyandot Street, Dayton...near the Oregon District); www.warpedwing.com</i>		



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Day 3	
S5 Agenda – Thursday, 14 July 2016	
0730-0800	Sign-in at Registration Desk
0800-0805	Welcome and Administrative Remarks
0805-0835	V&V of Autonomy: UxV Challenge Problem (UCP) <i>Mr. Jon Hoffman, AFRL/RQQA</i>
0835-0905	Specification and Analysis of Requirements with SpeAR 2.0 <i>Dr. Jennifer Davis, Rockwell Collins</i>
0905-0935	High-level Requirements and Arguments for the UCP <i>Mr. M. Anthony Aiello, Dependable Computing</i>
0935-1005	UCP Compositional Requirements Structure <i>Mr. Aaron Fifarek, LinQuest Corporation</i>
1005-1035	BREAK ☕ (30 min)
1035-1105	Generating Certification Evidence from Architecture Model Analysis <i>Mr. Brian LaValley, WW Technology Group</i>
1105-1135	Evidence-based Trust of Verification and Validation Techniques for High-Assurance Composable Systems <i>Dr. Robby, Galois, Inc.</i>
1135-1305	LUNCH 🍴 (on your own)
1305-1335	Robust Verification of Cyber-Physical Systems <i>Dr. Pavithra Prabhakar, Kansas State University</i>
1335-1405	Complementary Formal Techniques for Verification and Validation of Complex Autonomous Systems <i>Dr. Aurora Schmidt, Johns Hopkins University's Applied Physics Lab</i>
1405-1435	Efficient Analysis of Cyber-Physical Systems using Symbolic Methods <i>Dr. Sergiy Bogomolov, Institute of Science and Technology (IST) Austria</i> <i>Previously scheduled but unable to present due to illness</i> Early Dependability Assessment of FPGA-Based Space Applications Using Formal Verifications <i>Dr. Khaza Anuarul Hoque, University of Texas at Arlington</i>
1435-1505	BREAK ☕ (30 min)
1505-1535	Formal Methods for Certification: Why and How? <i>Mr. Lucas Wagner, Rockwell Collins</i>
1535-1605	Active Learning of Autonomy Performance Modes and Their Transitions for Test Scenario Generation <i>Dr. Galen Mullins, Johns Hopkins University's Applied Physics Lab</i>
1605-1635	A Real-Time Scratchpad-centric OS for Multi-core Embedded Systems <i>Mr. Renato Mancuso, University of Illinois at Urbana-Champaign</i>
1635-1705	Towards Automatic Software Verification for Safety-Critical Cyber-Physical Systems <i>Dr. Miroslav Pajic, Duke University</i>
1705-1705	Closing Remarks



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Poster Session – Wednesday, 13 July 2016

Assuring Behavior of Autonomous (UxV) Systems

Mr. John Lee, Northrop Grumman Corporation

A Timing Verification Problem in Multi-UAV Systems

Dr. Bjorn Andersson, Software Engineering Institute | Carnegie Mellon University

Certification strategies using run-time safety assurance for part 23 autopilot systems

Dr. Loyd Hook, University of Tulsa

Efficient Analysis of Cyber-Physical Systems using Symbolic Methods

Dr. Sergiy Bogomolov, Institute of Science and Technology Austria

Examination of Gain Scheduling and Fuzzy Controllers as Provable Candidates of Reversionary Controllers in a Run-Time Assurance Control System

Mr. Aaron Fifarek, LinQuest Corporation in support of Air Force Research Laboratory

Human Machine Team (HMT) Architecture Design for Live Virtual Constructive (LVC) Environment Towards Training Medical First Responders

Mr. Praveen Damacharla, The University of Toledo

Input Attribution for Statistical Model Checking

Dr. Jeffrey Hansen, Software Engineering Institute | Carnegie Mellon University

IV&V of Autonomous Systems in a Model Based Engineering Context

Mr. Mike Nolan, Raytheon

Live, Virtual, Constructive Testing of Autonomous Systems

Dr. David Scheidt, Johns Hopkins University's Applied Physics Lab

Model Generation for Hybrid Systems Verification in Hyst

Dr. Stanley Bak, Air Force Research Labs Autonomous Control Branch

Run-Time Assurance Design for Nonlinear Adaptive Control of Quadrotor UAVs

Dr. Xiaodong Frank Zhang, Wright State University

Spectrum-based Anomaly Detection For Real-time Systems

Dr. Sebastian Fischmeister, University of Waterloo

The Bugs Framework (BF): A Structured, Integrated Framework to Express Software Bugs

Dr. Yan Wu, Bowling Green State University

The Importance of “Good” Requirements to Future Safety Critical Cyber-Physical Systems

Mr. Peter Stanfill, Lockheed Martin Aeronautics – Skunk Works

Verification of Physiological Data Collection

Mr. Colin Elkin, The University of Toledo