



Safe and Secure Systems and Software Symposium(S5)

As of 1521EDT, 03 Aug 2017

Day 1		S5 Agenda – Tuesday, 01 Aug 2017	
0730-0800		Check-in	
0800-0815		Welcome and Administrative Remarks	
0815-0845		Keynote: Steal This Drone: High-Assurance Cyber Military Systems (HACMS) <i>Dr. Darren Cofer, Fellow, Rockwell Collins Advanced Technology Center</i>	
0845-0905		Topic Area Overview & Motivation <i>Dr. Derek Kingston, AFRL/RQQA VVCAS Team Lead</i>	
0905-0920		BREAK ☕ (15 min)	
0920-0950	7	Overview of Ongoing Autonomy TEVV Efforts and the Way Forward <i>Dr. David Scheidt, Weather Gage Technologies, LLC</i>	
0950-1020	7	Early Planning and Execution for Evidence-Based Operational Readiness Credentials in the Acquisition Life-Cycle: Lessons Learned and Recommendations <i>Kevin Carter (Colsa), Paul Salchak (Air Force Life Cycle Management Center)</i>	
1020-1050	7	Toward an Autonomous System Development, Test, and Evaluation Ecosystem <i>Dr. Patrick J. Martin, BAE Systems - Technology Solutions</i>	
1050-1105		BREAK ☕ (15 min) & Poster Setup	
1105-1135	8	Architectural Modeling and Analysis of a Geofence Application <i>Dr. Jennifer Davis, Rockwell Collins</i>	
1135-1205	8	Integrating Run-Time and Design-Time Assurance for AOS (Autonomy Operating System) <i>Dr. Michael Lowry, NASA Ames</i>	
1205-1335		LUNCH 🍴🍷 (on your own)	
1335-1405	2	Using SpeAR to satisfy DO-178C Requirements <i>Lucas Wagner, Rockwell Collins</i>	
1405-1435	5	An ASTM Standard for Bounding Behavior of Adaptive Algorithms for Unmanned Aircraft Operations <i>Dr. Stephen P. Cook, Fellow, Northrop Grumman Office of Independent Airworthiness</i>	
1435-1505	2	Architecture-based design and analysis with BIP <i>Anastasia Mavridou, Vanderbilt University</i>	
1505-1520		BREAK ☕ (15 min) & Poster Setup	
1520-1550	2	Quality-of-Service-Oriented Architectures for Cyber-Physical Systems <i>Marilyn Wolf, Georgia Institute of Technology</i>	
1550-1620	2	Designing a Modeling Framework for Autonomous Course of Action Selection <i>Lauren Hinkle, Charles River Analytics</i>	
1620-1800		Poster Session & Networking Event <i>Salon C & D</i>	



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Day 2		S5 Agenda – Wednesday, 02 Aug 2017	
0730-0800		Sign-in at Registration Desk and Poster Setup in Salon C&D	
0800-0805		Welcome and Administrative Remarks	
0805-0835	2	Asserting Controller Robustness and Safety of Unmanned Aircraft Systems <i>Mr. J. Micah Fry, Virginia Tech</i>	
0835-0905	3	Computer-aided Design for Safe Autonomous Vehicles <i>Rahul Mangharam, University of Pennsylvania</i>	
0905-0935	4	An Automated Approach to Object Code Verification <i>Shan Bhattacharya, LDRA Technology</i>	
0935-0950		BREAK ☕ (15 min)	
0950-1020	4	Proving Functional Correctness with the Software Analysis Workbench <i>Aaron Tomb, Galois, Inc.</i>	
1020-1050		 Keynote: AFRL Aerospace Systems Directorate Overview <i>Dr. Doug Blake, SES, Director, Aerospace Systems Directorate, Air Force Research Labs</i>	
1050-1200		Poster Session <i>Salon C & D</i>	
1200-1330		LUNCH 🍴 (on your own)	
1330-1400	1	Traceability Support for Evolving Safety Assurance Cases <i>Jane Cleland-Huang and Robyn Lutz, University of Notre Dame; Iowa State University</i>	
1400-1430	1	Improving the Verification Awareness of Autonomous Systems <i>Rose F. Gamble, University of Tulsa</i>	
1430-1500	1	Modeling Incremental Autonomy of a UAS in Support of Reasoning About Applicable Assurance Methods <i>Dr. Jonathan Rowanhill, Dependable Computing LLC</i>	
1500-1515		BREAK ☕ (15 min)	
1515-1545	2	Using Formal Methods to Reason About Neural Network Based Autonomous Systems <i>Dr. Stephen Magill, Galois, Inc.</i>	
1545-1615	9	The One-Out-Of-m Multicore Problem <i>Dr. James H. Anderson, The University of North Carolina at Chapel Hill</i>	
1615-1630		BREAK ☕ (15 min)	
1630-1700	5	Use of Controls Approaches for Verification, Validation and Certification of Distributed Mission Management Controls for Unmanned Systems <i>Dr. Prakash Sarathy, Northrop Grumman Aerospace Systems</i>	
1700-1730	5	Mathematical/Formal Approaches to Assuring Software Behavior towards UAV System Certification <i>Bill Sebring / Dr. Prakash Sarathy, Northrop Grumman Aerospace Systems</i>	
1730-1730		Closing Remarks	
1730-1930		No-Host Social – Dublin Pub <i>(300 Wayne Ave., Dayton...near the Oregon District); www.dubpub.com</i>	





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Come join us on the 3rd day to hear about AFRL's Summer of Innovation Project!



The Summer of Innovation project is a partnership with the Air Force Research Laboratory, Wright Brothers Institute, and approximately 16 other contracted partners from academia, government, and industry. The project is modeled after the "Google Summer of Code" program, a 14-week "innovation workshop" with a team of experts in Formal Methods and software design. The teams have been working with AFRL's open source version of their Unmanned Systems Autonomy Services architecture (UxAS) which contains approximately 50 state of the art cooperative control, path planning and surveillance software services.

Day 3	S5 Agenda – Thursday, 03 Aug 2017
0730-0800	Sign-in at Registration Desk
0800-0805	Welcome and Administrative Remarks
0805-0835	What is AFRL's Summer of Innovation? <i>Matt Clark / Dr. Derek Kingston, Air Force Research Labs (AFRL)</i>
0835-0905	Argument Group – Dr. Ben Rodes
0905-0935	Requirements Group – Tony Aiello
0935-1005	BREAK ☕ (30 min)
1005-1035	System Safety Group – Dr. Mauricio Castillo-Effen
1035-1115	Architecture Group – Dr. Jen Davis
1115-1145	Real-time / Middleware / Run-time Assurance (RTA) Groups – Dr. James Edmondson
1145-1315	LUNCH 🍴🕒 (on your own)
1315-1345	Hybrid Systems Group – Dr. Stanley Bak
1345-1415	Task / Service Planning Group – Dr. John Backes
1415-1435	Memory Safety of UxAS Tasks – Retrofitting UxAS with Rust <i>Adam Foltzer, Galois, Inc.</i>
1435-1505	BREAK ☕ (30 min)
1505-1535	Mission Planning Group – Dr. Bardh Hoxha
1535-1605	Testing Group – Dr. Sriram Sankaranarayanan
1605-1635	Wrap-up
1635-1635	Closing Remarks



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Poster Session

Automatically Support Generation and Maintenance of An Assurance Case

Chung-Ling Lin, Western Michigan University

GPCA Requirements in SpeAR A Case Study

Ms. Erika Hoffman, AFRL; Mr. M. Anthony Aiello, Dependable Computing; Mr. Aaron Fifarek, LinQuest Corporation

WebGME-BIP: A Design Studio for Modeling, Analyzing, and Generating Systems with BIP

Anastasia Mavridou, Vanderbilt University

Combining Formal Methods with Optimized Test Design for Verification of Complex Systems

John A. Sauter, Soar Technology

A Risk-aware A* Algorithm for Resilient Mission Plans

Dr. Sarra Alqahtani and Dr. Rose F. Gamble, University of Tulsa

Drone Forensics: A Preliminary Flight Log Analysis of Micro Drones

Ankit L. P. S Renduchintala, University of Toledo

Integrating Advanced V&V Approaches into Industrial Product Development Processes

Michael Nolan, Raytheon IV&V Technology Interest Group Co-chair

Examination of Gain Scheduling and Fuzzy Controllers with Hybrid Reachability

Aaron Fifarek, LinQuest Corporation

High-Assurance Runtime Verification

Eric G. Cooper and Dr. Alwyn E. Goodloe, NASA Langley Research Center

Architecture for an Indoor Distributed Cyber-Physical System Composed of Mobile Robots and Fog Computing Nodes

Nathaniel Hamilton and Dr. Taylor T. Johnson, Vanderbilt University

Moving Target Tracking with Formation Control by Groups of UAVs

Christina Wang and Dr. Taylor T. Johnson, Vanderbilt University

Towards A Run Time Policy Enforcement Framework for Multi-Platform Systems

Dr. Phu H. Phung, University of Dayton

The Need for Novel V&V Tools Over Solely More Modeling, Simulation, and Test

Dr. Christopher Elliott, Lockheed Martin Skunk Works