

SCIENCE OF SECURITY VIRTUAL ORGANIZATION

<http://sos-vo.org>

KATIE DEY

VANDERBILT UNIVERSITY



INFORMATION & COMPUTER SCIENCES
UNIVERSITY of HAWAII at MĀNOA



OUTLINE



- **The Cyber-Physical Systems Virtual Organization (CPS-VO)**
- **The Science of Security Virtual Organization (SoS-VO)**
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An Online Community to Advance Cyber-Security Science

SCIENCE OF SECURITY

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Science of Security VO

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In the Spotlight



Upcoming Events Worth Checking Out

The latest information on all upcoming science of security related events.

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Recent News

New Report on Measuring Computer and Security Expertise
Researchers at Indiana University released a technical report that...
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Insight to Modern Cyber Threat Intelligence
This article provides expert insights to modern cyber threat...
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Lablet Quarterly Meeting
exchanged research and technical discussions on SoS and the five Hard Problems in cybersecurity
For a brief summary of the two day quarterly Science of Security...
[more](#)

Upcoming Events

12/01/14 - 03/31/15
3rd Annual Best Scientific Cybersecurity Paper Competition

03/23/15 - 03/25/15
TCC 2015

03/26/15 - 03/27/15
MSPWorld Spring Conference 2015

Recently Posted Publications

Feature Cross-Substitution in Adversarial Classification
Abstract: The success of machine learning, particularly in supervised settings, has led to numerous attempts to apply it in adversarial settings such as spam and malware detection. The core challenge in this class of applications is that adversaries are not static data generators, but make a deliberate...
[more](#)

Subgroups

- Science of Security VO
 - Best Scientific Cybersecurity Paper Competition
 - CMU Science of Security Lablet Research Initiative
 - Moving Target Research
 - NCSU Science of Security Lablet Research Initiative
 - Science of SecUre and REsilient Cyber-Physical Systems (SURE)
 - SoS Lablet Reports
 - Symposium and Bootcamp

Newsletter

Best Scientific Cybersecurity Paper

HotSoS '15

Hard Problems

SOS LABLETS



CMU Science of Security Lablet Research Initiative | CPS-VO

Science of Security Lablet Research Initiative

UIUC Science of Security Lablet Research Initiative | CPS-VO

Science of Security Lablet Research Initiative

NCSU Science of Security Lablet Research Initiative | CPS-VO

Science of Security Lablet Research Initiative

UMD Science of Security Lablet Research Initiative | CPS-VO

Science of Security Lablet Research Initiative

CPS-VO

UMD Science of Security Lablet Research Initiative

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The UMD lablet leverages the resources of the Maryland Cybersecurity Center to bring together 15 University of Maryland faculty from five different departments across campus, in collaboration with 6 external faculty members from other universities, to focus on developing the scientific foundations for cybersecurity. Our lablet has particular strengths in *understanding the role of human behavior* in relation to cybersecurity, from the perspectives of both cyberattackers as well as legitimate users; in *developing theoretical foundations and mathematical models* for cybersecurity; and in *carrying out empirical studies* to measure, characterize, and better understand both existing cybersecurity threats and the effectiveness of current defenses.

LEAD PI

Jonathan Katz is the director of the Maryland Cybersecurity Center, as well as a professor in the Department of Computer Science at the University of Maryland, College Park.

Feedback

Chat (13)

RSITY

RESEARCH COMPETITION



Best Scientific Cybersecurity Paper Competition

Now accepting submissions for the 3rd annual competition



CPS-VO

Best Scientific Cybersecurity Paper Competition

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SUBGROUPS

MEMBER INFO

- 24 members
- Group Manager: [Heather Lucas](#)
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3rd Annual Best Scientific Cybersecurity Paper Competition Submission Guidelines

Now Open for Submissions



About the Competition

In order to encourage the development of the scientific foundations of cybersecurity, the National Security Agency (NSA) established The Annual Best Scientific Cybersecurity Paper Competition. NSA invites nominations of papers that show an outstanding contribution to cybersecurity science. A set of Distinguished Experts will review the nominations according to the criteria below. Awardees will be invited to NSA to receive the award and present the winning paper to an audience of cybersecurity experts.

Nominations and Eligibility

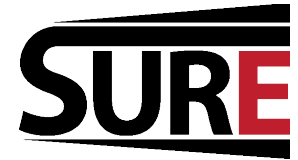
Papers published in peer-reviewed journals, magazines, or technical conferences are eligible for nomination. The date of the publication must be between January 1st 2014 and December 31st 2014. Nominations should include, in 500 words or less, a nomination statement describing the scientific contribution of the paper and explaining why this paper merits the award. A strong nomination statement is desired and will be used as part of the criteria when evaluating paper submissions. Nominated papers must be available in English and pdf format. Nominations must be submitted via this site - [Submit Here](#). The nominator may not be an author or co-author of the nominated paper. If a paper includes a reviewer as a co-author it may not be considered for an award. Papers may come from any field of cybersecurity research. (Please refer to the [SoS-VO discussion forum What is Security Science?](#))

Evaluation

A set of distinguished experts will review the submitted nominations and provide individual assessments to the NSA Research Directorate.

The following individuals have agreed to serve as distinguished experts for the 3rd annual competition:

WORKSHOP/ CONFERENCE SITES



Adoption of Cybersecurity Technology Workshop

Sandia National Laboratories, Albuquerque, NM

CPS-VO

Adoption of Cybersecurity Technology Workshop

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This is an invitation only event.

ACT Workshop March, 3-5 2015

Special thanks to all the ACT participants. We are currently collecting presentations and will post them to the agenda soon.

The Adoption of Cybersecurity Technology (SCORE) Subcommittee. SCORE increase cyber-related research and development to

As a community, researchers and developers implemented for a variety of reasons. Many known solutions that have not been implemented

Participants in the workshop will identify system change business practices to enable these work within their home organizations to improve

In order to illuminate systemic barriers to addressing phishing threat and its aftermath. Participants each of the four fundamental cybersecurity

- Device Integrity
- Damage Containment
- Defense of Accounts (Authentication)
- Secure and Available Transport

The agenda will include briefings on a special groups, facilitated sessions that address the Participants will take ownership of the solution Technology Organizing Committee every 9

Symposium and Bootcamp on the Science of Security (HotSoS)




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Symposium and Bootcamp on the Science of Security (HotSoS)

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April 21 and 22, University of Illinois at Urbana-Champaign

Hot SoS is a research event centered on the Science of Security, which aims to address the fundamental problems of security in a principled manner.

The 2015 Hot SoS event, to be held April 21 and 22 at the University of Illinois at Urbana-Champaign, will bring together researchers from numerous disciplines who seek a comprehensive and methodical approach to identifying and removing threats.

The motivation behind the nascent Science of Security is to understand how computing systems are architected, built, used, and maintained with a view to understanding and addressing security challenges systematically across their life cycle. In particular, two features distinguish the Science of Security from previous research programs on security.

- Scope.** The Science of Security considers not just computational artifacts but incorporates the human, social, and organizational aspects of computing within its purview.
- Approach.** The Science of Security takes a decidedly scientific approach, based on the understanding of empirical evaluation and theoretical foundations as developed in the natural and social sciences, but adapted as appropriate for the artificial science (in Herb Simon's term) that is computing.





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Science of SecUre and REsilient Cyber-Physical Systems (SURE)

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The project on the **System Science of SecUrity and REsilience** for cyber-physical systems (SURE) will develop foundations and tools for designing, building, and assuring cyber-physical systems (CPS) that can maintain essential system properties in the presence of adversaries. The technology base of SURE will provide CPS designers and operators with models, methods, and tools that can be integrated with an end-to-end model-based design flow and tool chain.

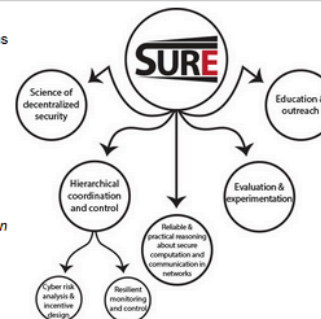
To date, security and resilience have been considered as largely disjoint (frequently even totally missing) aspects of CPS design. This separation was natural due to the traditionally segmented nature of design flows along isolated aspects of physical and cyber (software and computing) design. However, modern CPS does not permit such separation anymore due to advances and integration in wireless sensor-actuator networks, the internet of "everything", data-driven analytics, and machine-to-machine interfaces. These developments have given CPS the ability to inter-operate and adapt to open dynamic environments, and enabled new trends: (1) Faster operational time-scales; (2) Greater spatial interconnectedness; (3) Larger number of mixed initiative interactions; and (4) Increased heterogeneity of components. These trends are forcing increasingly physical and cyber sides of systems to be tightly coupled. The failure of loosely coupled physical and cyber schemes is evident in chronically unresolved design conflicts between performance and resilience against faults and intrusions, and conflicts between needs for performance optimization while maintaining robustness against adversarial impacts.

Networked CPS can be designed using a hierarchical coordination and control architecture that ensures resilient distributed dynamics. Resilient dynamics generalize functional performance by augmenting design concerns to attain robustness against faults and cyber attacks. The effects of failures and intrusions are usually modeled as uncertainties and casted as adversarial games. One of the key innovations is the introduction of a novel layer in the hierarchical coordination control architecture that is designed for interaction with the human operators using risk analysis and incentive-based approaches. The role of the risk analysis and incentive design is to support distributed decision making for balancing performance and security risks. The theoretical foundations for this innovation lie on dynamic games. The expected benefit of this framework is its potential of helping the convergence of individual decisions toward optimizing mission success.

As integral part of the proposed research program, we will launch a sustained effort to create a new generation of engineers that are comfortable with understanding, exploiting and managing security and resilience in the context of integrated computational, physical phenomena interacting with human designers and operators.

Research Thrusts

1. *Hierarchical Coordination and Control* which is organized further into:
 - i. *Cyber risk analysis and incentive design* that aim at developing regulations and strategies at the management level.
 - ii. *Resilient monitoring and control* of the networked control system infrastructure
2. *Science of decentralized security* which aims to develop a framework that will enable reasoning about the security of all the integrated constituent CPS components.
3. *Reliable and practical reasoning about secure computation and communication in networks* which aims to contribute a formal framework for reasoning about security in CPS.
4. *Evaluation and experimentation* using modeling and simulation integration of cyber and physical platforms that directly interface with human decision.
5. *Education and Outreach* component that aims at education the next generation of researchers in the field of security and resilience of CPS.





Science of Secure and Resilient Cyber-Physical Systems (SURE)

CPS-VO » SCIENCE OF SECURITY VO » SCIENCE OF SECURE AND RESILIENT CYBER-PHYSICAL SYSTEMS (SURE) » RESEARCH TEAM

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Principal Investigators

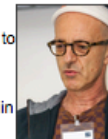
Xenofon Koutsoukos (Lead PI) is a Professor in the Department of Electrical Engineering and Computer Science at Vanderbilt University. He is also a Senior Research Scientist in the Institute for Software Integrated Systems (ISIS). Before joining Vanderbilt, Dr. Koutsoukos was a Member of Research Staff in the Xerox Palo Alto Research Center (PARC) (2000-2002), working in the Embedded Collaborative Computing Area. He received his PhD in Electrical Engineering from the University of Notre Dame in 2000. His research work is in the area of cyber-physical systems with emphasis on formal methods, distributed algorithms, diagnosis and fault tolerance, and adaptive resource management. He has published numerous journal and conference papers and he is co-inventor of four US patents. He was the recipient of the NSF Career Award in 2004, the Excellence in Teaching Award in 2009 from the Vanderbilt University School of Engineering, and the 2011 NASA Aeronautics Research Mission Directorate (ARMD) Associate Administrator (AA) Award in Technology and Innovation.



Saurabh Amin (MIT PI) is an Assistant Professor in the MIT Department of Civil and Environmental Engineering. His research focuses on the design and implementation of resilient network control algorithms for infrastructure systems. He works on robust diagnostics and control problems that involve using networked systems to facilitate the monitoring and control of large-scale critical infrastructures, including energy, transportation, and water distribution systems. He also studies the effect of security attacks and random faults on the survivability of these systems, and designs incentive mechanisms to reduce network risks.



Dusko Pavlovic (U. of Hawaii PI) was born in Sarajevo, studied mathematics at Utrecht, and was a postdoc at McGill, before starting an academic career in computer science at Imperial College and at Sussex. He left academia from 1999 to 2009 to work in software research at the Kestrel Institute in Palo Alto. He was a Visiting Professor at Oxford University from 2008-2012, Professor of Information Security at Royal Holloway, University of London (part time at University of Twente in the Netherlands) 2010-2013. He took his current chair in Computer Science at University of Hawaii at Manoa in 2013.



Through the years, Dusko's publications covered a wide area of research interests, from mathematics (graphs, categories) through theoretical computer science (semantics, symbolic computation) and software engineering (behavioral specifications, adaptation), to security (protocols, trust, physical security) and network computation (information extraction). Dusko's past publications and the slides of some of his recent talks are available from his web page.

S. Shankar Sastry (UC Berkeley PI) received his B.Tech. from the Indian Institute of Technology, Bombay, 1977, a M.S. in EECS, M.A. in Mathematics and Ph.D. in EECS from UC Berkeley, 1979, 1980, and 1981 respectively. S. Shankar Sastry is currently dean of the College of Engineering. He was formerly the Director of CITRIS (Center for Information Technology Research in the Interest of Society) and the Banatao Institute @ CITRIS Berkeley. He served as chair of the EECS department from January, 2001 through June 2004. In 2000, he served as Director of the Information Technology Office at DARPA. From 1996-1999, he was the Director of the Electronics Research Laboratory at Berkeley, an organized research unit on the Berkeley campus conducting research in computer sciences and all aspects of electrical engineering. He is the NEC Distinguished Professor of Electrical Engineering and Computer Sciences and holds faculty appointments in the Departments of Bioengineering, EECS and Mechanical Engineering. Prior to joining the EECS faculty in 1983 he was a professor at MIT.



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Science of Secure and Resilient Cyber-Physical Systems (SURE)

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Project Title

Decentralization in Security: Consequences and Incentive Des...

In security, our concern is typically with securing a particular network, or eliminating security holes in a particular piece of software. These are important, but they miss the fact that being secure is fundamentally about security of all constituent...

Evaluation and Experimentation

This research thrust focuses on the design and development of a highly accessible and scalable testbed environment for supporting the evaluation and experimentation efforts across the entire SURE research portfolio. This work is based on our existing...

Resilience and security in component-based software architec...

Abstract:

Cyber-Physical Systems are converging towards a component-oriented and platform-based implementation. The community-driven Robotic Operating Systems and the proprietary Residential Operating System (of Prodea) are just two examples that indicate...

Resilient Monitoring and Control

CPS employ Networked Control Systems (NCS) to facilitate real-time monitoring and control. Security of the NCS infrastructure is a large problem due to (1) the wide deployment of commercial-off-the-shelf (COTS) computing devices, (2) the connectivity of...

Threat Modeling/Risk Analysis

With the increased use of cyber physical systems in current defense, medical, and energy applications, it is critical for the infrastructure to remain secure. As such, it is important to identify potential security flaws early in the design process in...

🔧 Evaluation and Experimentation

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Submitted by [volgy](#) on Tue, 10/07/2014 - 12:25pm

Research Team

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This research thrust focuses on the design and development of a highly accessible and scalable testbed environment for supporting the evaluation and experimentation efforts across the entire SURE research portfolio. This work is based on our existing technologies and previous results with the Command and Control Windtunnel (C2WT), a large-scale simulation integration platform and WebGME, a metaprogrammable web-based modeling environment with special emphasis on on-line collaboration, model versioning and design-reuse. We are utilizing these core technologies and other third-party tools (e.g. Emulab) to provide a web-based interface for designing, executing and evaluating testbenches on a cloud-based simulation infrastructure. The metaprogrammable environment enables us to develop and provide modeling languages, which specifically target each research thrust. Furthermore, by leveraging built-in prototypical inheritance we are building re-usable library components in the target domains.

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First, the developed visual/modeling languages will be used to capture the physical, computational and communication infrastructure. Also, the simulation models will describe the deployment, configuration and/or the concrete strategies of security measures and algorithms. Third, the environment will provide entry points for injecting various attack or failure events from an existing library of components or by providing a model-based description of the algorithm.

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For stimulating the experimentation and validation efforts in the SURE research thrusts and to motivate students and outside contributors to participate we are developing "Red Team" vs "Blue Team" simulation scenarios, where a using a given CPS infrastructure model each team is tasked to develop and/or configure security and fail-over measures while the other team develops an attack model. After the active design phase--when both teams are working in parallel and in isolation--the simulation is executed with no external user interaction, potentially several times. The winner is decided based on the scoring weights and rules which are captured by the infrastructure model. If successful, we may organize championships and maintain a leader board for each infrastructure model.

PI



[volgy](#)

Peter Volgyesi is a Research Scientist at the Institute for Software Integrated Systems at Vanderbilt University. In the past decade Mr. Volgyesi has been working on several novel and high impact projects sponsored by DARPA, NSF, ONR, ARL and industrial companies (Lockheed Martin, BAE Systems, the Boeing Company, Raytheon, Microsoft). He is one of the architects of the Generic Modeling Environment, a widely used metaprogrammable visual modeling tool, and WebGME - its modern web-based variant. Mr. Volgyesi had a leading role in developing the real-time signal processing algorithms in PinPtr, a low cost, low power countersniper system. He also participated in the development of the Radio Interferometric Positioning System (RIPS), a patented technology for accurate low-power node localization. As PI on two NSF funded projects Mr. Volgyesi and his team developed a low-power software-defined radio platform (MarmotE) and a component-based development toolchain targeting multicore SoC architectures for wireless cyber-physical systems. His team won the Preliminary Tournament of the DARPA Spectrum Challenge in September, 2013.

Related Artifacts

📁 SURE: Topics -> Evaluation and experimentation

🏠 [Online Collaborative Environment for Designing Complex Computational Systems](#)

🏠 [Rapid Synthesis of Multi-Model Simulations for Computational Experiments in C2](#)

📄 [System Science of SecUrity and Resilience for Cyber-Physical Systems \(SURE\)](#)

Science of SecUre and REsilient Cyber-Physical Systems (SURE)

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🔗 Online Collaborative Environment for Designing Complex Computational Systems

VIEW

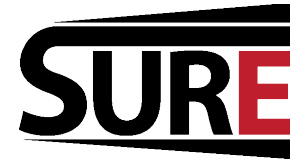
Home	Submitted by volgy on Tue, 10/07/2014 - 1:58pm
Research Team	Title Online Collaborative Environment for Designing Complex Computational Systems
Projects	Publication Type Conference Paper
Meetings	Year of Publication 2014
Members	Authors Maroti, Miklos, Kereskenyi, Robert, Tamas Kecskes, Volgyesi, Peter, Ledeczi, Akos
Files	Conference Name The International Conference on Computational Science (ICCS 2014)
SUBGROUPS	Date Published 06/2014
MEMBER INFO	Publisher Elsevier Procedia
	Conference Location Cairns, Australia
	Keywords cyberinfrastructure, Evaluation and experimentation, Foundations, model-based software; online collaboration; automatic code generation; web-based design environment, Modeling, Resilient Systems, science of security, simulation, Testing, Validation and Verification, WebGME
	Abstract Developers of information systems have always utilized various visual formalisms during the design process, albeit in an informal manner. Architecture diagrams, finite state machines, and signal flow graphs are just a few examples. Model Integrated Computing (MIC) is an approach that considers these design artifacts as first class models and uses them to generate the system or subsystems automatically. Moreover, the same models can be used to analyze the system and generate test cases and documentation. MIC advocates the formal definition of these formalisms, called domain-specific modeling languages (DSML), via metamodeling and the automatic configuration of modeling tools from the metamodels. However, current MIC infrastructures are based on desktop applications that support a limited number of platforms, discourage concurrent design collaboration and are not scalable. This paper presents WebGME, a cloud- and web-based cyberinfrastructure to support the collaborative modeling, analysis, and synthesis of complex, large-scale scientific and engineering information systems. It facilitates interfacing with existing external tools, such as simulators and analysis tools, it provides custom domain-specific visualization support and enables the creation of automatic code generators.
	DOI 10.1016/j.procs.2014.05.227
	Citation Key 4630

Groups: Science of SecUre and REsilient Cyber-Physical Systems (SURE)

model-based software; online collaboration; automatic code generation; web-based design environment WebGME cyberinfrastructure

Evaluation and experimentation Foundations Validation and Verification Modeling Resilient Systems Science of Security Simulation Testing

FILE ARTIFACTS



Science of SecUre and REsilient Cyber-Physical Systems (SURE)

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Hierarchical Coordination and Control	35.88 MB	6
Science of decentralized security	3.21 MB	1
Reliable and practical reasoning about secure c...	3.21 MB	1
Evaluation and experimentation	3.21 MB	1
System Science of SecUry and Resilience for C...	3.21 MB	[download file]
Education and outreach	0 bytes	0
▼ SURE: Meetings	52.66 MB	10
Kickoff Meeting, Oct'14	52.66 MB	10
Covert flows and authentication in cyber, physi...	4.73 MB	[download file]
CPS Gets Noticed: IIC, IOT, IIOT...	773.24 KB	[download file]
Incentive Mechanisms for CPS Security	22.93 MB	[download file]
Model-Based Simulation for Evaluation of CPS Se...	3.23 MB	[download file]
Resilience and Security in Component-Based Soft...	3.02 MB	[download file]
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The Science of Decentralized Security for Cyber...	6.25 MB	[download file]

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SURE Review Meeting - March 17-18, 2015

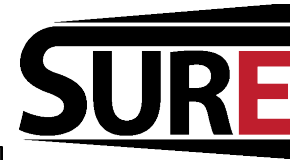
The SURE Project review meeting will be held Tuesday, March 17 through Wednesday, March 18, 2015. The meeting will be held at Vanderbilt University in Nashville, Tennessee. The address is **1025 16th Avenue South, Nashville, TN 37212**.

Please register for the meeting at <http://cps-vo.org/sure/reviewmtg2015/registration>.

Program Agenda

TUESDAY, MARCH 17, 2015	
1200 - 1300	<i>Registration Lunch pickup</i> Project Overview Xenofon Koutsoukos (Vanderbilt)
1300 - 1345	Evaluation Testbed Peter Volgyesi and Himanshu Neema (Vanderbilt University)
1345 - 1430	Science of Adversarial Risk in CPS Yevgeniy Vorobeychik (Vanderbilt)
1430 - 1445	<i>Break</i>
1445 - 1530	Incentive Mechanisms for CPS Security Saurabh Amin (MIT)
1530 - 1615	Malware Classification - Title TBD Anthony Joseph (UC Berkeley)
1615 - 1700	Modeling Privacy in Human CPS Roy Dong (UC Berkeley)
WEDNESDAY, MARCH 18, 2015	
0830 - 0900	<i>Check-In Continental breakfast</i>
0900 - 0945	Secure Computation in Actor Networks Dusko Pavlovic (U of Hawaii)
0945 - 1015	Attack-Resilient Observation Selection Aron Laszka (Vanderbilt University)
1015 - 1045	Resilient Sensor Network Design for Flow Networks Waseem Abbas (Vanderbilt University)
1045 - 1100	<i>Break</i>
1100 - 1145	Resilient CPS - Title TBD Claire Tomlin (UC Berkeley)
1145 - 1215	Resilient and Secure Component-Based Software for CPS Architectures Gabor Karsai (Vanderbilt University)
	<i>Lunch Pickup</i>
1215 - 1315	Science of Security Virtual Organization Katie Dey (Vanderbilt University)
1315 - 1345	Demo: Resilient and Secure Component-Based Software for CPS Architectures William Emfinger and Pranav Kumar (Vanderbilt University)
1345 - 1430	Information Flow Policy in CPS Janos Sztipanovits (Vanderbilt University)
1430 - 1500	<i>Wrap-up and feedback</i>
1500	<i>Meeting adjourned</i>

PRESENTATIONS



Science of Secure and Resilient Cyber-Physical Systems (SURE)

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🔒 **Modeling Privacy in Human Cyber-Physical Systems**

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Submitted by [Katie Dey](#) on Tue, 03/17/2015 - 11:02am. Contributor: [Roy Dong](#)

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Other available formats:

Modeling Privacy in Human Cyber-Physical Systems

PDF document | 5.86 MB | 15 reads | 3 downloads | Download | PDF version | Printer-friendly version

Presentation Academia Review Meeting, Mar'15 human cyber-physical systems privacy Science of Security Foundations Resilient Systems

INTERNAL WORKING GROUP



CPS-VO

Science of SecUre and Resilient Cyber-Physical Systems (SURE), internal

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Welcome

This is a private group accessible only to team members from Berkeley, U of Hawaii, MIT, and Vanderbilt.

Quick Links

- Public SURE group: <http://cps-vo.org/group/sos/sure> (Currently private)
- Science of Security VO group: <http://cps-vo.org/group/sos>
- Science of Security Labet groups: CMU, NCSU, UMD, UIUC

Project List: <http://cps-vo.org/node/17238>

Previous quarterly SoS Labet meeting archives:

- 2014: CMU
- 2013: NCSU, UIUC, CMU
- 2012: NCSU, UIUC, CMU

Previous SoS community meeting archives:

- 2014 Symposium and Bootcamp on the Science of Security
- 2012 Science of Security Community Meeting

Teleconference Particulars

USA Toll-Free: 888-446-7584
USA Caller Paid/International Toll: 212-372-3742
Participant code: 8363915

Upcoming Events

04/21/15 - 04/22/15
2015 Symposium and Bootcamp on the Science of Security (HotSoS)

07/14/15 - 07/15/15
SoS Quarterly Labet Meeting at CMU

10/13/15 - 10/14/15
SoS Quarterly Labet Meeting at UMD

more ▶

Past Events

01/06/15 - 01/07/15
Quarterly SoS Labet Meeting

10/28/14 - 10/29/14
Quarterly SoS Labet Meeting

10/30/14 - 10/31/14
CONFLICT: Bill McKeever

10/30/14
Conflict: Gabor

more ▶

INTERNAL WORKING GROUP



Science of Secure and Resilient Cyber-Physical Systems (SURE), internal

CPS-VO » SCIENCE OF SECURITY VO » SCIENCE OF SECURE AND RESILIENT CYBER-PHYSICAL SYSTEMS (SURE) » SCIENCE OF SECURE AND RESILIENT CYBER-PHYSICAL SYSTEMS (SURE), INTERNAL » REPORTING

Reporting

EDIT GROUP TRACK CLONE TAXONOMY BROADCAST PANELS DEVEL GROUP STATS

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NEW PROJECT REPORT

Title	Quarter	Institution	Workflow
<input type="text"/>	Aug-Oct 2014 Nov'14-Jan'15	MIT U of Hawaii UC Berkeley Vanderbilt	In Progress Ready for Review Accepted

Research Thrust(s)

Cyber risk analysis and incentive design
 Hierarchical Coordination and Control
 Resilient monitoring and control
 Science of decentralized security
 Reliable and practical reasoning about secure computation and communication in networks
 Evaluation and experimentation
 Education and outreach

Apply Reset

Project Title	Quarter	Hard Problem(s)	Status	Created	Updated
Risk Analysis and Incentive Design & Resilient Monitoring and Control	Aug-Oct 2014	Cyber risk analysis and incentive design, Hierarchical Coordination and Control, Resilient monitoring and control	Accepted	Mar 3 2015 - 5:52pm	Mar 3 2015 - 5:52pm
Risk Analysis and Incentive Design & Resilient Monitoring and Control	Nov'14-Jan'15	Cyber risk analysis and incentive design, Hierarchical Coordination and Control, Resilient monitoring and control	Accepted	Mar 3 2015 - 5:26pm	Mar 3 2015 - 5:26pm
Resilient Sensor Network Design For Infrastructure Flow Networks	Nov'14-Jan'15	Resilient monitoring and control	Accepted	Feb 20 2015 - 10:22am	Mar 3 2015 - 5:55pm
Evaluation Testbed	Nov'14-Jan'15	Evaluation and experimentation	Accepted	Feb 19 2015 - 10:05pm	Mar 3 2015 - 5:55pm
Resilience and security in component-based software architectures for CPS	Nov'14-Jan'15	Resilient monitoring and control	Accepted	Feb 19 2015 - 9:39pm	Mar 3 2015 - 5:55pm
Science of Trust and Running Actor Networks	Nov'14-Jan'15	Reliable and practical reasoning about secure computation and communication in networks	Accepted	Feb 19 2015 - 9:02pm	Mar 3 2015 - 5:55pm
Price of Anarchy in Decentralized Security	Nov'14-Jan'15	Science of decentralized security	Accepted	Feb 9 2015 - 3:51pm	Mar 3 2015 - 5:55pm
Secure Control, Optimization, and Machine Learning for CPS	Aug-Oct 2014	Hierarchical Coordination and Control, Science of decentralized security	Accepted	Oct 30 2014 - 6:23pm	Feb 19 2015 - 8:45pm
Resilient Sensor Network Design For Flow ...	Aug-Oct ...	Resilient monitoring and control	Accepted	Oct 30 2014 - ...	Feb 19 2015 - ...

COLLABORATE

SUBGROUPS

MEMBER INFO



CPS-VO

Science of SecUre and REsiliant Cyber-Physical Systems (SURE), reporting

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COLLABORATE ▶

SUBGROUPS ▼

- Science of Security VO
 - CMU Science of Security Lablet Research Initiative
 - NCSU Science of Security Lablet Research Initiative
 - Science of SecUre and REsiliant Cyber-Physical Systems (SURE)
 - Science of SecUre and REsiliant Cyber-Physical Systems (SURE), internal
 - Science of SecUre and REsiliant Cyber-Physical Systems (SURE), reporting

MEMBER INFO ▶

This is the private reporting website accessible to members of this group only.

Quarterly Technical Reports

Year 1

- **Quarter 1:** August 1, 2014 - October 31, 2014
- **Quarter 2:** November 1, 2014 to January 31, 2015

Publications, Presentations, and Posters

Year 1

- Quarter 1
- Quarter 2

WHAT'S NEXT?



- Publish tools and software

The screenshot displays the WebGME web application interface. The browser address bar shows 'sure.webgme.org'. The main workspace contains a diagram titled 'ExampleScenario' with a central blue router node labeled 'ALL'. This router is connected to several other nodes: three red hexagonal nodes labeled 'RED1', 'RED2', and 'RED3'; two traffic light nodes labeled 'INTERSECTION1' and 'INTERSECTION2'; and five circular nodes labeled 'LOOP1' through 'LOOP5'. Green arrows indicate connections from the router to the intersection and loop nodes, while red arrows indicate connections from the intersection and loop nodes to the router. A search bar with '0.75x' magnification is visible on the left side of the workspace.

On the left, the 'PANEL 1: Composition' sidebar lists various tool icons: ATTACK (red hexagon), CONTROLLER (blue router), LIGHT (traffic light), SUMODATA (gear), and SENSOR (radio waves). The right sidebar shows the 'OBJECT BROWSER' with a tree view containing 'ROOT', 'DSC', 'ExampleScenario', 'FCO', 'Language', and 'Library'. Below it is the 'PROPERTY EDITOR' for 'ExampleScenario', showing fields for GUID, ID, name, and META, along with checkboxes for 'isAbstract' and 'isPort', and a list of 'usedAddOns'.

At the bottom of the interface, there is a status bar with the text '© 2015 Vanderbilt University version: 0.7.1' on the left, and 'IN SYNC', 'CONNECTED', 'LOG: WARNING', and 'ON' on the right.

THANK YOU



SURE site

<http://cps-vo.org/group/sos/sure>

Katie Dey

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AGENDA



0830 – 0900: Check-In | Continental Breakfast

0900 – 0945: **Secure Computation in Actor Networks**
Dusko Pavlovic (U of Hawaii)

0945 – 1015: **Attack-Resilient Observation Selection**
Aron Laszka (Vanderbilt University)

1015 – 1045: **Resilient Sensor Network Design for Flow Networks**
Waseem Abbas (Vanderbilt University)

1045 – 1100: Break

1100 – 1145: **Using Machine Learning to Improve the Resilience of Control**
Claire Tomlin (UC Berkeley)

1145 – 1215: **Resilient and Secure Component-Based Software for CPS Architectures**
Gabor Karsai (Vanderbilt University)

1215 – 1315: Lunch Pickup

Science of Security Virtual Organization
Katie Dey (Vanderbilt University)

1315 – 1345: **Demo: Resilient and Secure Component-Based Software for CPS Architectures**
William Emfinger and Pranav Kumar (Vanderbilt University)

1345 – 1430: **Information Flow Policy in CPS**
Janos Sztipanovits (Vanderbilt University)

1430 – 1500: Wrap-up and feedback

1500 Adjourned