The 47ᵗʰ Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2017)

Conference Program

Sponsored by:

Monday, June 26, 2017			
8:00 – 17:00	**Registration** Location: Plaza Exhibit/Foyer		
8:30 – 10:00	**SSIV Workshop** The 3rd International Workshop on Safety and Security of Intelligent Vehicles Location: Governors Square 16	**RADIANCE Workshop** International Workshop on Recent Advances in the Dependability Assessment of Complex systems Location: Governors Square 17	**Tutorial 1** A practical view of modeling and quantification of network survivability Location: Plaza Court 3	
10:00 – 10:30	**Coffee Break** Location: Plaza Exhibit/Foyer		
10:30 – 12:00	SSIV Workshop	RADIANCE Workshop	Tutorial 1	
12:00 – 13:30	**Lunch** Location: Plaza Ballroom F		
13:30 – 15:00	SSIV Workshop	RADIANCE Workshop	Tutorial 1	**Tutorial 2** LLFI and the Art of Fault Injection Location: Plaza Court 4
15:00 – 15:30	**Coffee Break**		
15:30 – 17:00	SSIV Workshop	RADIANCE Workshop	Tutorial 1	Tutorial 2
17:30 – 19:30	**Conference Reception** Location: Plaza Exhibit/Foyer		

Tuesday, June 27, 2017

8:00 – 17:00	**Registration** Location: Plaza Exhibit/Foyer
8:30 – 9:15	**Opening remarks and Jean-Claude Laprie award presentation** Location: Plaza Ballroom D & E
9:15 – 10:15	**Keynote I** **The Cybersecurity Imperative** Farnam Jahanian, University Provost and Chief Academic Officer, Carnegie Mellon University Location: Plaza Ballroom D & E Chair: Paulo Verissimo
10:15 – 10:45	**Coffee Break**

10:45 – 12:15	**Session 1: Best Paper Award Candidates** Location: Plaza Ballroom D & E Chair: Pascal Felber and Evgenia Smirni **Information Leakage in Encrypted Deduplication via Frequency Analysis** Jingwei Li (University of Electronic Science and Technology of China); Chuan Qin, Patrick P. C. Lee (The Chinese University of Hong Kong); Xiaosong Zhang (University of Electronic Science and Technology of China) **Privacy Disclosure Through Smart Meters: Reactive Power Based Attack and Defense** Jingyao Fan (The Pennsylvania State University); Qinghua Li (University of Arkansas); Guohong Cao (The Pennsylvania State University) **What Can We Learn from Four Years of Data Center Hardware Failures?** Guosai Wang, Wei Xu (Institute for Interdisciplinary Information Sciences, Tsinghua University)
12:15 – 13:45	**Lunch** Location: Plaza Ballroom F

	Session 2A: Algorithms and Agreement	Session 2B: Hardware	Session 2C: Fast Abstracts
13:45 – 15:15	Location: Plaza Ballroom D&E Chair: Paulo Verissimo **Fast Atomic Multicast** Paulo Coelho (University of Lugano); Nicolas Schiper (EPFL); Fernando Pedone (University of Lugano) **Speeding up Consensus by Chasing Fast Decisions** Balaji Arun, Sebastiano Peluso, Roberto Palmieri, Giuliano Losa, Binoy Ravindran (Virginia Tech) **Secure Causal Atomic Broadcast, Revisited** Sisi Duan (Oak Ridge National Laboratory); Michael K. Reiter (University of North Carolina at Chapel Hill); Haibin Zhang (University of Connecticut)	Location: Governors Square 16: Chair: Devesh Tiwari **Reducing the "Tax" of Reliability: A Hardware-Aware Method for Agile Data Persistence in Mobile Devices** Meng Wang, Huxiang Chen (University of Florida); Tao Li (NSF/University of Florida) **Exploring the Potential for Collaborative Data Compression and Hard-Error Tolerance in Resistive Memories** Amin Jadidi, Mohammad Arjomand (Pennsylvania State University); Mohammad Khavari Tavana, David Kaeli (Northeastern University); Mahmut Kandemir, Chita Das (Pennsylvania State University) **One Bit is (Not) Enough: An Empirical Study of the Impact of Single and Multiple Bit-Flip Errors** Behrooz Sangchoolie (Chalmers University of Technology); Karthik Pattabiraman (University of British Columbia); Johan Karlsson (Chalmers University of Technology)	Location: Governors Square 17: Chair: Matti Hiltunen **Software-Defined HoneyNet: Towards Mitigating Link Flooding Attacks** Jinwoo Kim and Seungwon Shin **TDSC: Two-Stage DDoS Detection and Defense System Based on Clustering** Shuang Wei, Yijing Ding, and Xinhui Han **The Many Conflicting Visions of 'Safety Case'** Patrick J. Graydon **RFID Tag Grouping Protocols Made Private** Yudai Komori, Kazuya Sakai, and Satoshi Fukumoto **Off-Path Caching for File Versioning in Named Data Networking** Mamoru Ohara and Satoshi Fukumoto **Portable SDN Testbed Prototype** Josh Alcorn, Scott Melton, and C. Edward Chow **A Framework for SDN Network Evaluation** Josh Alcorn, Scott Melton, and C. Edward Chow **Document Faults: An Extension of the Taxonomy of Dependable and Secure Computing** Algirdas Avižienis **Opportunities and Challenges of Third-Party Sustainment of Critical Software in Dependable Systems** Kate Gill and Rob Ashmore

15:15 – 15:45	**Coffee Break**		
	Location: Plaza Ballroom Exhibit/Foyer		

| | **Session 3A: Symbolic Execution and Synthesis Tools**
 Location: Plaza Ballroom D & E
 Chair: Gilles Muller

 StatSym: Vulnerable Path Discovery through Statistics-guided Symbolic Execution
 Fan Yao, Yongbo Li, Yurong Chen, Hongfa Xue, Guru Venkataramani, Tian Lan, (The George Washington University)

 Dependability-aware design space exploration for optimal synthesis parameters tuning
 Ilya Tuzov, Juan Carlos Ruiz, David de Andres (ITACA-UPV)

 pbSE: Phase-based Symbolic Execution
 QixueXiao, YuChen (Tsinghua University); ChenggangWu (Institute of Computing Technology Chinese Academy of Sciences); KangLi (Dept. of Computer Science Athens, Georgia) | **Session 3B: Trusted Execution**
 Location: Governors Square 16
 Chair: Bojan Cukic

 IM-Visor: A Pre-IME Guard to Prevent IME Apps from Stealing Sensitive Keystrokes Using TrustZone
 Chen Tian, Yazhe Wang (State Key Laboratory of Information Security, Institute of Information Engineering, Chinese Academy of Sciences); Peng Liu (College of Information Sciences and Technology, Pennsylvania State University, University Park); Qihui Zhou, Chengyi Zhang (State Key Laboratory of Information Security, Institute of Information Engineering, Chinese Academy of Sciences)

 Rollback and Forking Detection for Trusted Execution Environments using Lightweight Collective Memory
 Marcus Brandenburger, Christian Cachin (IBM Research - Zurich); Matthias Lorenz, Rüdiger Kapitza (TU Braunschweig)

 Secure Tera-scale Data Crunching with a Small TCB
 Bruno Vavala (Carnegie Mellon University (U.S.) & University of Lisbon (Portugal)); Nuno Neves (University of Lisbon (Portugal)); Peter Steenkiste (Carnegie Mellon University (U.S.)) | **Session 3C: Industry Track I: Architecture and Evaluation of (Dependable) Systems and Networks**
 Location: Governors Square 17
 Chair: Cristian Constantinescu

 Invited Talk: Robert Baumann, Texas Instruments **The Space Radiation Environment and Component Mitigation Techniques for Dependable Space Systems**

 RT Level vs. Microarchitecture Level Reliability Assessment: Case Study on ARM Cortex-A9 CPU
 Athanasios Chatzidimitriou, Manolis Kaliorakis, Dimitris Gizopoulos, Maurizio Iacaruso, Mauro Pipponzi, Riccardo Mariani and Stefano Di Carlo.

 Exact Reliability Computation
 Thanikesavan Sivanthi, Yvonne-Anne Pignolet and Vincent Débieux. |
| 15:45 – 17:15 | | | |

Wednesday, June 28, 2017

8:00 – 17:00	**Registration** Location: Plaza Ballroom Exhibit/Foyer

8:30 – 9:30	**Keynote II** **A Decade of Self-Driving Cars** Bryan Salesky, CEO, Argo AI Location: Plaza Ballroom D & E Chair: Shivakant Mishra

9:30 – 10:00	**Carter Award Presentation** Location: Plaza Ballroom D & E

10:00 – 10:30	**Coffee Break** Location: Plaza Ballroom Exhibit/Foyer

10:30 – 12:00	**Session 4A: Binaries** Location: Plaza Ballroom D & E Chair: Saman Zonouz Practical Experience Report **Concolic Execution on Small-Size Binary Codes: Challenges and Empirical Study** Hui Xu (CUHK); Yangfan Zhexceou, Yu Kang (Fudan University); Michael R Lyu (CUHK) **Towards Automated Discovery of Crash-Resistant Primitives in Binaries** Benjamin Kollenda (Ruhr-Universität Bochum); Enes Goktas (Vrije Universiteit Amsterdam); Tim Blazytko, Philipp Koppe, Robert Gawlik (Ruhr-Universität Bochum); R.K. Konoth, Cristiano Giuffrida, Herbert Bos (Vrije Universiteit Amsterdam); Thorsten Holz (Ruhr-Universität Bochum) **Function Interface Analysis: A Principled Approach for Function Recognition in COTS Binaries** Rui Qiao, R Sekar (Stony Brook University)	**Session 4B: Cloud** Location: Governors Square 16 Chair: Fernando Pedone **Multimodal Indexable Encryption for Mobile Cloud-based Applications** Bernardo Ferreira, João Leitão, Henrique Domingos (FCT/UNL & NOVA LINCS) **Secure Live Migration of SGX Enclaves on Untrusted Cloud** Jinyu Gu, Zhichao Hua, Yubin Xia, Haibo Chen (Shanghai Jiao Tong University); Binyu Zang (Shanghai Jiao Tong University); Haibing Guan (Shanghai Jiao Tong University); Jinming Li (Huawei) **ContainerLeaks: Emerging Security Threats of Information Leakages in Container Clouds** Xing Gao (College of William and Mary); Zhongshu Gu, Mehmet Kayaalp, Dimitrios Pendarakis (IBM T.J. Watson Research Center); Haining Wang (University of Delaware)	**Session 4C: Industry Track II: Cloud Computing and the Internet of Things (IoT)** Location: Governors Square 17 Chair: Karthik Pattabiraman Invited talk: Ben Zorn, Microsoft **Technical Disruption, Agility, and Dependability** **Providing Resiliency to Orchestration and Automation Engines in Hybrid Cloud** Long Wang, Harigovind Ramasamy, Alexei Karve and Rick Harper. **Uptime-Optimized Cloud Architecture as a Brokered Service** Sreekrishnan Venkiteswaran and Santonu Sarkar.

12:00 – 13:30	**Lunch**		
	Location: Plaza Ballroom F		
13:30 – 15:00	 Location: Plaza Ballroom D & E Chair: Patrick Lee **Athena: A Framework for Scalable Anomaly Detection in Software-Defined Networks** Seunghyeon Lee, Jinwoo Kim, Seungwon Shin (KAIST); Phillip Porras, Vinod Yegneswaran (SRI International) **Bloom Filters and LSTM Networks For Multi-level Anomaly Detection in Industrial Control Systems** Cheng Feng, Tingting Li, Deeph Chana (Institute for Security Science and Technology, Imperial College London) **Revisiting Random Walk based Sybil Detection in Online Social Networks** Jinyuan Jia, Neil Zhenqiang Gong (Iowa State University)	**Session 5B:** **Wireless and Sensors** Location: Governors Square 16 Chair: Saurabh Bagchi **Towards Secure and Verifiable Database-driven Spectrum Sharing** Zhili Chen (Anhui University); Lin Chen (University of Paris-Sud); Hong Zhong (Anhui University) **Sensor-based Implicit Authentication of Smartphone Users** Wei-Han Lee, Ruby Lee (Princeton University) **REMAX: Reachability-Maximizing P2P Detection of Erroneous Readings in Wireless Sensor Networks** Varun Badrinath Krishna, Michael J. Rausch, Benjamin E. Ujcich, Indranil Gupta, William H. Sanders (University of Illinois at Urbana-Champaign)	**Session 5C: Industry Track III: Dependability Data and Security** Location: Governors Square 17 Chair: Alan Wood **Enhancing Anomaly Diagnosis of Automatic Train Supervision System Based on Operation Log** Yan Li, Binbin Chen, Vincent W. Zheng, William Temple, Zbigniew Kalbarczyk and Yue Wu. **Automating DRAM Fault Mitigation By Learning From Experience** Elisabeth Baseman, Nathan Debardeleben, Kurt Ferreira, Vilas Sridharan, Taniya Siddiqua and Olena Tkachenko. **HYDRA: HYbrid Design for Remote Attestation (Using a Formally Verified Microkernel)** Karim Eldefrawy, Norrathep Rattanavipanon and Gene Tsudik. **MAS: Mobile-Apps Assessment and Analysis System** Chin-Wei Tien, Chia-Wei Tien, Tse-Yung Huang, Ting-Chun Huang, Wei-Ho Chung and Sy-Yen Kuo **A Visit to the Jungle of Terminology** Algirdas Avizienis

15:00 – 15:30	**Coffee Break**
	Location: Plaza Ballroom Exhibit/Foyer

15:30 – 17:00	**Session 6A:** Dependable Systems and Software Location: Plaza Ballroom D & E Chair: Domenico Cotroneo **Agora: A Dependable High-Performance Coordination Service for Multi-Cores** Rainer Schiekofer (Friedrich-Alexander-Universität Erlangen-Nürnberg); Johannes Behl (TU Braunschweig); Tobias Distler (Friedrich-Alexander-Universität Erlangen-Nürnberg) **Load-Optimal Local Fast Rerouting for Dependable Networks** Yvonne-Anne Pignolet (ABB Research, Switzerland); Stefan Schmid (Aalborg Uni, Denmark & TU Berlin, Germany); Gilles Tredan (LAAS, CNRS, Toulouse, France) **JMake: Dependable Compilation for Kernel Janitors** Julia Lawall, Gilles Muller (Sorbonne Universites/Inria/UPMC/LIP6)	**Session 6B:** Measurement Studies Location: Governors Square 16 Chair: Chuan Yue **Counting in the Dark: Caches Discovery and Enumeration in the Internet** Amit Klein, Haya Shulman, Michael Waidner (Fraunhofer SIT) **Entropy-Based Security Analytics: Measurements from a Critical Information System** Marcello Cinque, Raffaele Della Corte, Antonio Pecchia (Federico II University of Naples, Italy) **Exploring the Long Tail of (Malicious) Software Downloads** Babak Rahbarinia (Auburn University Montgomery); Marco Balduzzi (Trend Micro Inc.); Roberto Perdisci (University of Georgia)	**Session 6C:** Student Forum Location: Governors Square 17 Chair: Saurabh Bagchi **Modeling Error Propagation in Programs** Guanpeng Li, University of British Columbia, Canada **Automated Program Diversity using Program Synthesis** Abraham Chan, University of British Columbia, Canada **Evaluation of the dependability of critical infrastructures using hybrid Petri nets with random variables and stochastic simulation** Carina Pilch, Institute of Mathematics and Computer Science, Munster, Germany **Enabling Low Degraded Read Latency and Fast Recovery for Erasure Coded Cloud Storage Systems** Peng Li, Nankai University, China

17:30 – 21:00	**Conference Banquet** **Visit to Denver Art Museum and Dinner – Ticket Required** **Walking departure from hotel (5:15pm)**

Thursday, June 29, 2017			
8:00 – 16:00	**Registration** Location: Plaza Ballroom Exhibit/Foyer		
8:30 – 10:00	**Session 7A: Android** Location: Plaza Ballroom D&E Chair: Marco Vieira **Ghost Installer in the Shadow: Security Analysis of App Installation on Android** Yeonjoon Lee (Indiana University); Tongxin Li (Peking University); Nan Zhang (Indiana University); Soteris Demetriou (University of Illinois at Urbana-Champaign); Mingming Zha (Chinese Academy of Sciences); XiaoFeng Wang (Indiana University); Kai Chen (Chinese Academy of Sciences); Xiaoyong Zhou (Samsung Research); Xinhui Han (Peking University); Michael Grace **DyDroid : Measuring Dynamic Code Loading and Its Security Implications in Android Applications** Zhengyang Qu (Northwestern University); Shahid Alam (Qatar University); Yan Chen (Northwestern University); Xiaoyong Zhou (Google); Wangjun Hong (Northwestern University); Ryan Riley (Qatar University) **JGRE: An Analysis of JNI Global Reference Exhaustion Vulnerabilities in Android** Yacong Gu (Chinese Academy of Sciences); Kun Sun (George Mason University); Purui Su (Chinese Academy of Sciences); Qi Li (Tsinghua University); Yemian Lu, Lingyun Ying, Dengguo Feng (Chinese Academy of Sciences)	**Session 7B: Privacy and Security** Location: Governors Square 16 Chair: Sonia Ben Mokhtar **I know nothing about you but here is what you might like** Rachid Guerraoui (EPFL); Anne-Marie Kermarrec (Inria); Rhicheek Patra (EPFL); Mahammad Valiyev (TU Munich); Jingjing Wang (EPFL) **What You See is Not What You Get! Thwarting Just-in-Time ROP with Chameleon** Ping Chen, Jun Xu (Pennsylvania State University); Zhisheng Hu (Pennsylvania State University); Xinyu Xing (Pennsylvania State University); Minghui Zhu (Pennsylvania State University); Bing Mao (Nanjing University); Peng Liu (Pennsylvania State University) **DynaMiner: Leveraging Offline Infection Analytics for On-the-Wire Malware Detection** Birhanu Eshete, V.N. Venkatakrishnan (University of Illinois at Chicago)	**Session 7C: Best of SELSE** Location: Governors Square 17 Chair: Alan Wood **Evaluation and Mitigation of Soft Errors in Neural Network-based Object Detection in Three GPU Architectures** Fernando Fernandes dos Santos, Lucas Draghetti, Lucas Weigel, Luigi Carro, Philippe Navaux, and Paolo Rech (Instituto de Informatica, Universidade Federal do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brasil) **DRAM Scaling Error Evaluation Model Using Various Retention Time** Seong-Lyong Gong (UT Austin), Jungrae Kim (Microsoft), and Mattan Erez (UT Austin) **Deep Healing: Ease the BTI and EM Wearout Crisis by Activating Recovery** Xinfei Guo and Mircea R. Stan (Department of Electrical and Computer Engineering, University of Virginia)

10:00 – 10:30	**Coffee Break** Location: Plaza Ballroom Exhibit/Foyer		
10:30 – 12:00	**Session 8A: Analytic Models** Location: Plaza Ballroom D & E Chair: Eric Rozier **Statistical Model Checking for hybrid Petri Nets with multiple general transitions** Carina Pilch, Anne Remke (Westfälische Wilhelms-Universität Münster) **Deadline-Aware Multipath Communication: An Optimization Problem** Laurent Chuat, Adrian Perrig (ETH Zurich); Yih-Chun Hu (University of Illinois at Urbana-Champaign) **Attacker-Induced Traffic Flow Instability in a Stream of Semi-Automated Vehicles** Daniel D. Dunn, Samuel A. Mitchell, Imran Sajjad (Utah State University); Ryan M. Gerdes (Virginia Tech); Rajnikant Sharma (University of Cincinnati); Ming Li (University of Arizona)	**Session 8B: Power System and Smart Grid** Location: Governors Square 16 Chair: Felicita Di Giandomenico **Practical Experience Report Smart Maintenance via Dynamic Fault Tree Analysis: A Case Study on Singapore MRT System** Yan Liu, Yue Wu (Advanced Digital Science Center); Zbigniew Kalbarczyk (University of Illinois at Urbana-Champaign) **RL-BLH: Learning-Based Battery Control for Cost Savings and Privacy Preservation for Smart Meters** Jinkyu Koo, Xiaojun Lin, Saurabh Bagchi (Purdue University) **Compromising Security of Economic Dispatch in Power System Operations** Devendra Shelar (Massachusetts Institute of Technology); Pengfei Sun (Rutgers University); Saurabh Amin (Massachusetts Institute of Technology); Saman Zonouz (Rutgers University)	**Session 8C: Tool/Demo: Security and Testing Tools** Location: Governors Square 17 Chair: Anne Remke **Fex: A Software Systems Evaluator** Oleksii Oleksenko, Dmitrii Kuvaiskii, Pramod Bhatotia, Christof Fetzer (TU Dresden) **Demonstrating a Tool for Injection Attack Prevention in MySQL** Ibéria Medeiros (LaSIGE, Faculdade de Ciências da Universidade de Lisboa); Miguel Beatriz (INESC-ID, Instituto Superior Técnico da Universidade de Lisboa); Nuno Neves (LaSIGE, Faculdade de Ciências da Universidade de Lisboa); Miguel Correia (INESC-ID, Instituto Superior Técnico da Universidade de Lisboa) **Zipr: Efficient Static Binary Rewriting for Security** William Hawkins, Jason D. Hiser, Michele Co, Anh Nguyen-Tuong, Jack W. Davidson (University of Virginia)
12:00 – 13:30	**Lunch** Location: Plaza Ballroom F		

| 13:30 – 15:00 | **Session 9A:** Attacks
Location: Plaza Ballroom D & E
Chair: Karthik Pattabiraman

ATTAIN: An Attack Injection Framework for Software-Defined Networking
Benjamin E. Ujcich, Uttam Thakore, William H. Sanders (University of Illinois at Urbana-Champaign)

The Balance Attack Against Proof-Of-Work Blockchains: The R3 Consortium as an Example
Christopher Natoli, Vincent Gramoli (Data61-CSIRO and University of Sydney)

Voiceprint: A Novel Sybil Attack Detection Method for VANETs
Yuan Yao (Northwestern Polytechnical University); Bin Xiao (The Hong Kong Polytechnic University); Gaofei Wu (Northwestern Polytechnical University); Xue Liu (McGill Univerisity); Zhiwen Yu, Kailong Zhang, Xingshe Zhou (Northwestern Polytechnical University) | **Session 9B: Protocol and Behavioral Analysis**
Location: Governors Square 16
Chair: Yair Amir

Analysing Selfishness Flooding with SEINE
Guido Lena Cota (Università degli Studi di Milano); Sonia Ben Mokhtar (LIRIS-CNRS-INSA Lyon); Gabriele Gianini (Università degli Studi di Milano); Julia Lawall, Gilles Muller (Sorbonne Universités, Inria, CNRS, UPMC, LIP6); Ernesto Damiani (Università degli Studi di Milano, EBTIC/Khalifa University); Lionel Brunie (LIRIS-CNRS-INSA Lyon)

Detecting Passive Cheats in Online Games via Performance-Skillfulness Inconsistency
Daiping Liu (University of Delaware); Xing Gao (College of William and Mary); Mingwei Zhang (Intel Labs); Haining Wang (University of Delaware); Angelos Stavrou (George Mason University)

Analyzing Operational Behavior of Stateful Protocol Implementations for Detecting Semantic Bugs
Endadul Hoque (Purdue University); Omar Chowdhury (University of Iowa); Sze Yiu Chau (Purdue University); Cristina Nita-Rotaru (Northeastern University); Ninghui Li (Purdue University) | |
| 15:15 – 16:15 | **Technical Committee Meeting**
Location: Plaza Ballroom D & E | | |