



DSN 2016

Toulouse • France
June 28 - July 1st

The 46th Annual IEEE/IFIP International Conference on Dependable Systems and Networks

PROGRAM



Sponsored by:  IEEE computer society



with support from:



Greetings from the General Chairs

We are delighted to welcome you to the 46th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), and to the vibrant City of Toulouse. Toulouse, the France's fourth largest city, is the center of the European aerospace industry. It also hosts hordes of hi-tech and IT businesses companies, and counts many universities and elite schools throughout the region.

Toulouse is hosting DSN for the third time since its creation in 1971. The General Chair of the two previous editions, in 1978 and 1993, was Jean-Claude Laprie, one of the precursors of the dependability field. Jean-Claude Laprie Award has been created in 2011 in his memory. To honor Jean-Claude and his contribution to the community, a special event is organized within DSN 2016. This event will provide a retrospective and a look into the future vision on dependable and secure computing. It includes short talks by some of the precursors of the dependability domain, recipients of the Jean-Claude Laprie Awards over this five-year period, in a special session before the conference start.

DSN is the most prestigious international forum for presenting advanced and innovative research results, problem solutions, practices, insights on new challenges in the field of dependable computing and security. The whole spectrum of IT and cyber-physical systems and application areas with stringent relevant dependability and security concerns are of interest to DSN, including innovative architectures, protocols and algorithms, models for performance and dependability evaluation, as well as, experimentation and assessment of dependable and secure systems and networks.

In addition to the regular paper category and experience reports in the main track, the program includes an industrial track, a student session, a fast abstract session, together with state-of-the-art workshops and tutorials. Also, a session presenting the best papers selected at the 2016 SELSE workshop, on Silicon Errors in Logic - System Effects, is included in the program.

The industrial track accommodates 16 industrial presentations keeping us in touch with the up-to-date state of practice and challenges in the industrial field, covering a wide spectrum of topics with participation from several companies from Europe and USA.

This year, an exciting program of six selected tutorials, spread over all conference days, gives attendees more opportunities to participate in one or a few of them. Short videos are posted on the conference web site introducing the tutorials.

Five workshops covering a diverse set of timely and challenging topics on dependability offer the opportunity to participants from academia and industry to exchange ideas about research challenges, solutions and practices in these areas.

We would like to express our gratitude to the chairs and members of the DSN Steering Committee, of the Program Committee, of all tracks, and to the conference coordinator for their support and their valuable contribution to set-up a rich and exciting technical program, and to the publication chair for his patience in managing the production of the proceedings.

We would like to thank our corporate sponsors, IEEE and IFIP, for making possible to continue the tradition of awarding student travel grants. This year the conference helped to fund the participation of 19 students. In addition we wish to thank the local sponsors, LAAS, CNRS, Conseil Départemental de la Haute-Garonne, ENAC, INP-ENSEEIH, Région Languedoc-Roussillon-Midi-Pyrénées, and Université Paul Sabatier for their valuable support to DSN 2016.

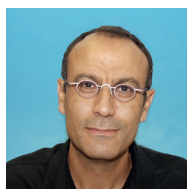
We would like to express our gratitude to the local organizing committee, to all the members of the Dependable and Fault Tolerance research group, and to several people at LAAS-CNRS who have worked very hard to make DSN-2016 a success.

Special thanks go to Jean Arlat, Yves Crouzet, Brigitte Ducrocq, Caroline Uhlmann Malé, Matthieu Roy from LAAS-CNRS for their daily contribution to several tasks of the organization process during the last year, and to Régine Barthes and Sophie Ménager from the CNRS-Délégation Régionale Midi-Pyrénées for their dedication in handling the registrations.

DSN gives the opportunity to share and learn from the experience of the participants. We hope you will find DSN 2016 to be an enriching and rewarding experience. Enjoy it and enjoy Toulouse!



Karama Kanoun
LAAS-CNRS



Mohamed Kaïniche
LAAS-CNRS

Organizing Committee

General Chairs

Mohamed Kaâniche and Karama Kanoun, LAAS-CNRS, FR

Conference Coordinator

Marco Vieira, University of Coimbra, PT

Publication Chair

Matthieu Roy, LAAS-CNRS, FR

Publicity

Zbigniew Kalbarczyk, Univ. of Illinois at Urbana Champaign, US; Sy-Yen Kuo, National Taiwan Univ., TW; Regina Moraes, UNICAMP, BR

Local Arrangements

Jean Arlat, Guillaume Auriol, Yves Crouzet, Dominique Daurat, Brigitte Ducrocq, Caroline Malé, LAAS-CNRS, FR ; Régine Barthes, Sophie Ménager, CNRS

Webmasters

Jérémie Guiochet and Nicolas Rivière, Toulouse-3 University & LAAS-CNRS, FR

Tweetmaster

Roberto Natella, Univ. di Napoli Federico II, IT

Program Committee

Chairs

Domenico Cotroneo, Univ. di Napoli Federico II, IT and Cristina Nita-Rotaru, Purdue Univ., US

Members

Emmanuelle Anceaume, IRISA, FR

Jean Arlat, LAAS-CNRS, FR

Ioana Baldini, IBM Research, US

Valeria Bertacco, Univ. of Michigan, US

Alysson Bessani, Univ. of Lisbon, PT

Doug Blough, Georgia Tech, US

Peter Buchholz, TU Dortmund, DE

Christian Cachin, IBM Research - Zurich, CH

Andrea Ceccarelli, Univ. of Florence, IT

Marcello Cinque, Univ. di Napoli Federico II, IT

Gabriela Ciocarlie, SRI, US

Bojan Cukic, Univ. of North Carolina at Charlotte, US

Xavier Defago, JAIST, JP

Felicità Di Giandomenico, ISTI-CNR, IT

Catello Di Martino, Bell Labs - Alcatel Lucent, US

Tadashi Dohi, Hiroshima Univ., JP

Susanna Donatelli, Univ. of Turin, IT

Tudor Dumitras, Univ. of Maryland at College Park, US

Pascal Felber, Univ. of Neuchâtel, CH

Christof Fetzer, TU Dresden, DE

Roy Friedman, Technion, IL

Guofei Gu, Texas A&M Univ., US

Boudewijn Haverkort, Univ. Twente, NL

Martin Hiller, Volvo Cars, SE

Zbigniew Kalbarczyk, Univ. of Illinois, US

Engin Kirda, Northeastern Univ., US

Jonathan Kirsch, Applied Communication Sciences, US
John Knight, Univ. of Virginia, US
Phil Koopman, Carnegie Mellon Univ., US
Patrick P. C. Lee, Chinese Univ. of Hong Kong, CN
Peng Liu, Pennsylvania State Univ., US
Michael Lyu, Chinese Univ. of Hong Kong, CN
Henrique Madeira, Univ. of Coimbra, PT
Eliane Martins, Univ. of Campinas, BR
Veena Mendiratta, Alcatel-Lucent, US
Gilles Muller, INRIA, FR
Brendan Murphy, Microsoft Research, GB
Onur Mutlu, Carnegie Mellon Univ., US
Takashi Nanya, Univ. of Tokyo, JP
Nuno Neves, Univ. of Lisbon, PT
Alina Oprea, RSA Labs, US
Karthik Pattabiraman, Univ. of British Columbia, CA
Mathias Payer, Purdue Univ., US
Roberto Perdisci, Univ. of Georgia, US
Atul Prakash, Univ. of Michigan, US
Leonardo Querzoni, Univ. di Roma La Sapienza, IT
Juan-Carlos Ruiz, Univ. Politecnica de Valencia, SP
Evgenia Smirni, College of William and Mary, US
Arun Somani, Univ. of Iowa, US
Lorenzo Strigini, City Univ. London, GB
Neeraj Suri, TU Darmstadt, DE
Olivier Thonnard, Amadeus, FR
Aad Van Moorsel, Newcastle Univ., GB
Sudharshan Vazhkudai, Oak Ridge National Labs, US
Paulo Verissimo, Univ. of Luxembourg, LU
Marco Vieira, Univ. of Coimbra, PT
Hélène Waeselynck, LAAS-CNRS, FR
Haining Wang, Univ. of Delaware, US
Dongyan Xu, Purdue Univ., US

Steering Committee

Yair Amir, John Hopkins University, US
Jean Arlat, LAAS-CNRS, FR
Roberto Baldoni, Sapienza Univ. of Rome, IT
Doug Blough (Chair), Georgia Tech, GA, US
Felicita Di Giandomenico, ISTI-CNR, IT
Pascal Felber, Univ. Neuchatel, CH
Christof Fetzer, TU Dresden, DE
Farnam Jahanian, Univ. of Michigan/NSF, US
Mohamed Kaâniche, LAAS-CNRS, FR
Jay Lala, Raytheon, US
Takashi Nanya, Canon, JP
Mike Reiter, Univ. of North Carolina, US
Bill Sanders, Univ. of Illinois at Urbana-Champaign, US
Rick Schlichting, AT&T, US
Neeraj Suri, TU Darmstadt, DE
Paulo Verissimo (Vice-Chair), Univ. of Luxembourg, LU
Chuck Weinstock, SEI/CMU, US

Industrial Track

Chairs

Cristian Constantinescu, AMD, US
Jean-Charles Fabre, INP-ENSEEIH & LAAS-CNRS, FR

Program Committee

Jean-Paul Blanquart, Airbus Defence & Space, FR
Vikas Chandra, ARM, US
Gabriella Carrozza, CAST, IT
Simon Fuerst, BMW, DE
Philip Koopman, CMU, US
Charles Lahorgue, ESA, NL
Nektarios Leontiadis, Facebook, US
Brendan Murphy, Microsoft, GB
Keun Soo Yim, Google, US
Mario Tokoro, Sony, JP
Pascal Traverse, Airbus Group, FR
Timothy Tsai, Nvidia, US
Alan Wood, Oracle, US

Workshops

Workshops Selection Chairs

Michel Cukier, University of Maryland, US
Karthik Pattabiraman, University British Columbia, CA

RSDA 2016: The 3rd International Workshop on Reliability and Security Data Analysis

Chairs

Antonio Pecchia, Federico II University of Naples, IT
Olivier Thonnard, Amadeus IT Group, FR

Program Committee

Leyla Bilge, Symantec Research Labs, US
Gabriella Carrozza, CAST, IT
Yue Chen, Florida State University
Marcello Cinque, Federico II University of Naples, IT
Gabriela Ciocarlie, SRI, US
Bojan Kukic, University of North Carolina at Charlotte, US
Salvatore D'Antonio, Parthenope University of Naples, IT
Raffaele Della Corte, CINI, IT
Catello Di Martino, Bell Labs, Alcatel-Lucent, US
Aurelien Francillon, Eurecom, FR
Zbigniew Kalbarczyk, University of Illinois at Urbana-Champaign, US
Dong-Seong Kim, University of Canterbury, AU
Ilir Gashi, City University London, GB
Michael Grottke, Friedrich-Alexander-Universitat, DE
Zhiling Lan, Illinois Institute of Technology, US
Corrado Leita, LastLine, GB
Federico Maggi, Politecnico di Milano, IT
Veena Mendiratta, Bell Labs, Alcatel-Lucent, US
Roberto Perdisci, University of Georgia, US
Roberto Pietrantuono, Federico II University of Naples, IT

Leonardo Querzoni, Sapienza University of Rome , IT
William Robertson, Northeastern University , IT
Arpan Roy, Infosys , US
Santonu Sarkar, BITS Pilani , IN
Yun Shen, Symantec Research Labs , US
Marco Vieira, University of Coimbra , PT
Ingo Weber, NICTA / University of South Wales , AU
Komminist Weldemariam, IBM Research , US
Keun Soo Yim, Google, US
Cong Zheng, Palo Alto Networks, US

RADIANCE 2016: The 2nd International Workshop on Recent Advances in the Dependability Assessment of Complex systems

Chairs

Ariadne Carvalho, UNICAMP, BR
Nuno Antunes, University of Coimbra, PT
Andrea Ceccarelli, University of Florence, IT
András Zentai, Prolan, HU

Program committee

Luciana Arantes, University of Pierre et Marie Curie, FR
Alysson Bessani, University of Lisbon, PT
Cristiana Bolchini, Polytechnic University of Milan, IT
Francesco Brancati, Resiltech s.r.l., IT
Luiz Buzato, IC-University of Campinas, BR
Javier Cámara, Carnegie Mellon University, US
Hector Cancela, University de la Republica, UR
David D'Andrés, Polytechnic University of Valencia, ES
Felicita Di Giandomenico, ISTI-CNR, IT
Catello Di Martino, Bell Labs, US
Susanna Donatelli, University of Torino, IT
Francesco Flammini, Ansaldo STS, IT
Barbara Gallina, Mälardalen University, SE
Nicolas Guelfi, University of Luxemburg, LU
Christian Kreiner, Graz University of Technology, AT
Jérémie Guiochet, LAAS-CNRS, France
Daniele Lezzi, Barcelona Supercomputer Center, ES
Paolo Lollini, University of Florence, IT
Fumio Machida, NEC, JP
Henrique Madeira, University of Coimbra, PT
István Majzik, Budapest University of Technology and Economics, HU
Parisa Marandi, Microsoft Research, GB
Eliane Martins, IC-University of Campinas, BR
Regina Moraes, FT-University of Campinas, BR
Roberto Natella, CINI/University of Naples, IT
Marcio Ribeiro, Federal University of Alagoas, BR
Nuno Silva, Critical Software S.A., PT
Vladimir Stankovic, City University of London, GB
Katinka Wolter, Free University of Berlin, DE

SSIV 2016: The 2nd International Workshop on Safety and Security of Intelligent Vehicles

Chairs

João Carlos Cunha (jcinha [at] isec.pt), ISEC, PT
Kalinka Branco (kalinka [at] icmc.usp.br), University São Paulo, BR
António Casimiro (casim [at] ciencias.ulisboa.pt), University of Lisboa, PT
Urbano Nunes (urbano [at] deec.uc.pt), University of Coimbra, PT

Program Committee

Bill Sanders, U. Illinois at Urbana-Champaign, USA
Christian Betstatter, Univ. Klagenfurt, AT
Daniel Schneider, Fraunhofer, DE
Denis Fernando Wolf, USP, BR
Francesco Rossi, Resiltech, IT
Hermann Kopetz, Univ. Vienna, AT
Jean-Paul Blanquart, Airbus Defence and Space, FR
Jiannong Cao, Hong Kong Polyt. Univ., HK
João Batista, USP, BR
João Moreira, Orbisat, BR
Jonas Nilsson, Volvo Cars, SE
José Eugenio Naranjo, Univ. Politec. Madrid, INSIA, ES
Jonny Vinter, SP, SE
Luís Almeida, Univ. Porto, PT
Mohan Trivedi, ECE, Univ California, San Diego, US
Nicolas Larrieu, ENAC, FR
Nuno Silva, Critical Software, PT
Philip Koopman, CMU, US
Philippe Martinet, IRCCYN, Ecole Centrale de Nantes, FR
Ravi Prakash, UT Dallas, US
Roberto Gallo, Kryptus, BR

ReSA4CI 2016: The 3rd International Workshop on Reliability and Security Aspects for Critical Infrastructure

Chairs

Silvia Bonomi, University of Rome La Sapienza, IT
Ilaria Matteucci, IIT-CNR, IT

Program Committee

Francois Bonnet, JAIST, JP
Andrea Ceccarelli, University of Florence, IT
Vittoria Cozza, IIT-CNR, IT
Michel Cukier, University of Maryland, US
Barbara Gallina, Malardalen University, SE
Joaquin Garcia-Alfaro, Institut Mines-Telecom, FR
Felicita Di Giandomenico, ISTI-CNR, IT
Karama Kanoun, LAAS, FR
Jonathan Kirsch, Vencore Labs, US
Paolo Masci, INESC-TEC, PT
Leonardo Montecchi, University of Florence, IT
Federica Paci, University of Southampton, GB
Marco Platania, AT&T, US
Alexander A. Schwarzmann, University of Connecticut, US
Saman Zonouz, Rutgers University, US

DISN 2016: The 2nd International Workshop on Dependability Issues on SDN and NFV

Chairs

Matti Hiltunen, AT&T Labs, US
Robert Soulé, Università della Svizzera italiana, CH
Elias P. Duarte Jr., Federal University of Parana, BR

Program committee

Alysson Bessani, Universidade de Lisboa, PT
Stenio Fernandes, UFPE, BR
Luciano Gaspary, UFRGS, BR
Lisandro Granville, UFRGS, BR
Raj Jain, Washington University in St. Louis, US
Fernando Pedone, Università della Svizzera italiana, CH
Christian Rothenberg, Unicamp, BR
Richard Schlichting, AT&T Labs, US
D. D. Sharma, AT&T, US
Paulo Verissimo, University of Luxembourg, LU
Marko Vukolic, IBM Zurich, CH
Patrick Eugster, Purdue University, US

Fast Abstracts

Chairs

Javier Alonso Lopez, Duke U., US, and U. of Leon, ES,
Antonio Casimiro, U. of Lisbon, PT

Program Committee

Michael Grottke, Friedrich-Alexander Univ., DE
Jonathan Kirsch, Applied Communication Sciences, US
Jose Orlando Pereira, Univ. of Minho, PT
Juan Carlos Ruiz, Politechnic Univ. of Valencia, ES
Francois Taiani, Univ. of Rennes 1, FR

Student Forum

Chairs

Robin Berthier, U. of Illinois at Urbana Champaign, US
Ilir Gashi, City U. London, GB

Program Committee

Rakesh Bobba, Oregon State University, US
Akito Monden, Okayama University, JP
Kizito Salako, City University London, GB
Bertrand Sobesto, University of Maryland, US
Gilles Trédan, LAAS-CNRS, FR
Saman Zonouz, Rutgers University, US

Tutorials

Chairs

Roberto Baldoni, Sapienza University of Rome, IT
Catello Di Martino, U. of Illinois at Urbana Champaign, US

Tuesday, June 28th

08:00 - 09:00	<i>Registration</i>						
09:00 - 11:00	RSDA Workshop on Reliability and Security Data Analysis	RADIANCE Workshop on Recent Advances in the Dependability Assessment of Complex systemEms	SSIV Workshop on Safety and Security of Intelligent Vehicles	ReSA4CI Workshop on Reliability and Security Aspects for Critical Infrastructure			Tutorial 3 Activating Protection and Exercising Recovery Against Large-Scale Outages on the Cloud
11:00 - 12:30					Tutorial 1 Common Safety Method for Risk Evaluation and Assessment (CSM-RA) and Hazard Analysis	Tutorial 2 Reliability and Availability Modeling in Practice	
12:30 - 13:30	<i>Lunch</i>						
14:00 - 17:30	RSDA Workshop on Reliability and Security Data Analysis	RADIANCE Workshop on Recent Advances in the Dependability Assessment of Complex systemEms	SSIV Workshop on Safety and Security of Intelligent Vehicles	DISN Workshop on Dependability Issues on SDN and NFV	Tutorial 1 Common Safety Method for Risk Evaluation and Assessment (CSM-RA) and Hazard Analysis	Tutorial 2 Reliability and Availability Modeling in Practice	Tutorial 3 Activating Protection and Exercising Recovery Against Large-Scale Outages on the Cloud
17:30 - 21:00	Jean-Claude Laprie Special Session and Reception						

Wednesday, June 29th

08:00 - 09:00	<i>Registration</i>				
09:00 - 09:30	Welcome				
09:30 - 11:00	Best Paper Candidates				
11:00 - 11:30	<i>Coffee Break</i>				
11:30 - 12:30	MT1A: Models	MT1B: Practical Experience Reports I		Industrial Track IT1: Position Papers	Tutorial 4 Measuring Resiliency through Field Data
12:30 - 14:00	<i>Lunch</i>				
14:00 - 15:30	MT2A: Storage Systems	MT2B: Software-Defined Networks	MT2C: Anomaly Detection and Exploits	IT2: Automotive and Aeronautics Systems Engineering	Tutorial 4 Measuring Resiliency through Field Data
15:30 - 16:00	<i>Coffee Break</i>				
16:00 - 17:30	MT3A: Data Centers Dependability	MT3B: Software Dependability	MT3C: Privacy	IT3: Security and Resilience	Tutorial 4 Measuring Resiliency through Field Data

Thursday, June 30th

08:00 -	<i>Registration</i>				
09:00 -	Keynote: Pascal Andrei, Airbus Group: «Aircraft Security from the Manufacturer Perspective»				
10:00 -	William Carter PhD Dissertation Award in Dependability				
10:30	Sebastiano Peluso (La Sapienza University of Rome, IT & Instituto Superior Técnico, Lisbon, PT)				
10:30 -	<i>Coffee Break</i>				
11:00 -	MT4A: Memory and Caches	MT4B: Cyber-physical Systems Security	MT4C: Malware	IT4: Computer Architecture and Networks	Tutorial 5: Building Highly-Available Distributed SDN Applications with ONOS
12:30					
12:30 -	<i>Lunch</i>				
14:00 -	MT5A: Hardware Errors Resiliency	MT5B: Operating Systems Security and Privacy	MT5C: Android Security	Fast Abstracts	Tutorial 5: Building Highly-Available Distributed SDN Applications with ONOS
15:30					
15:30 -	<i>Coffee Break</i>				
16:00	<i>Visit to Musuem & Banquet</i>				
22:30					

Friday, July 1st

08:00 -	<i>Registration</i>				
09:00 -	Keynote: Nicolas Demassieux, Orange Labs, France: «Paving the Way for Dependable Software Defined Infrastructures»				
10:00 -	IEEE Innovation in Societal Infrastructure Award				
10:30	For the Assessment-driven Design of Trustworthy Cyber Infrastructure for Electrical Systems William B. Sanders (UIUC, US)				
10:30 -	<i>Coffee Break</i>				
11:00 -	MT6A: Clouds & Networks	MT6B: Practical Experience Reports II	MT6C: Encryption and Security vs Performance	Best of SELSE Special Session	Tutorial 6: Resilience for Scientific Computing: From Theory to Practice
12:00					
12:30					
12:30 -	<i>Lunch</i>				
14:00 -	MT7A: Dependability Applications	MT7B: Passwords	MT7C: Network Security	Student Forum	Tutorial 6: Resilience for Scientific Computing: From Theory to Practice
15:00					
15:30					
15:30 -	<i>Wrapup and TC Meeting</i>				
16:30					

RSDA 2016 Workshop

The 3rd International Workshop on Reliability and Security Data Analysis

Tuesday, June 28th, 2016, 09:00 – 10:30

RSDA: Opening and Keynote Chair: Olivier Thonnard (Amadeus, FR) - Room: C08
<p>Welcome and Opening Antonio Pecchia (Federico II University of Naples, IT), Olivier Thonnard (Amadeus, FR)</p>
<p>RSDA 2016 Keynote: Towards a Quantitative Approach for Threat Mitigation and Response Hervé Debar (Télécom SudParis, FR)</p>

Tuesday, June 28th, 2016, 11:00 – 12:30

RSDA: Internet Threats and Countermeasures Chair: Marcello Cinque (Università degli Studi di Napoli Federico II, IT) - Room: C08
<p>Comparing Detection Capabilities of AntiVirus Products: An Empirical Study with Different Versions of Products from the Same Vendors Areej Algaith, Ilir Gashi (City University London, GB), Bertrand Sobesto, Michel Cukier (University of Maryland, US); Selman Haxhijaha, Gazmend Bajrami (University for Business and Technology, KO)</p>
<p>An Application of Unsupervised Fraud Detection to Passenger Name Records Remi Domingues, Francesco Buonara, Romain Senesi, Olivier Thonnard (Amadeus, FR)</p>
<p>MimeoDroid: Large Scale Dynamic App Analysis on Cloned Devices via Machine Learning Classifiers Parvez Faruki (Govt. MCA College, IN), Akka Zemhari (Université de Bordeaux, FR), Manoj Singh Gaur, Vijay Laxmi (Malaviya National Institute of Technology, IN), Mauro Conti</p>

Tuesday, June 28th, 2016, 14:00 – 15:30

RSDA: Error and Failure Detection Chair: Antonio Pecchia (Università degli Studi di Napoli Federico II, IT) - Room: C08
<p>Error Monitoring for Legacy Mission-Critical Systems Marcello Cinque, Raffaele Della Corte, Stefano Russo (Università degli studi di Napoli Federico II, IT)</p>
<p>SDC is in the Eye of the Beholder: A Survey and Preliminary Study Bo Fang (University of British Columbia, CA), Panruo Wu (University of California Riverside, US), Qiang Guan, Nathan Debardeleben, Laura Monroe, Sean Blanchard (Los Alamos National Laboratory, US); Zhizong Chen (University of California Riverside, US); Karthik Pattabiraman, Matei Ripeanu (University of British Columbia, CA)</p>
<p>Open Discussion: Reliability and Security Data Analysis: Challenges and Future Research Directions</p>

Tuesday, June 28th, 2016, 16:00 – 17:30

RSDA: Virtualization and Cloud Chair: Olivier Thonnard (Amadeus, FR) - Room: C08
<p>Classifying Virtual Machine Managers by Overhead Colin S. Murray (Air Force Research Laboratory, US)</p>
<p>Hunting Killer Tasks for Cloud System Through Behavior Pattern Learning Hongyan Tang, Ying Li, Tong Jia, Zhonghai Wu (Peking University, CN)</p>
<p>Closing Remarks and Announcements</p>

RADIANCE 2016 Workshop

The 2nd International Workshop on Recent Advances in the Dependability Assessment of Complex systems

Tuesday, June 28th, 2016, 09:00 – 10:00

RADIANCE: Keynote

Chair: Andrea Ceccarelli (Università di Firenze, IT) - Room: Breguet

Dependability Assessment of Network Function Virtualization
Domenico Cotroneo (Federico II University of Naples, IT)

Tuesday, June 28th, 2016, 10:00 – 10:30

RADIANCE: Preliminary Works on Dependability and Security

Chair: Leonardo Montecchi (Università di Firenze, IT) - Room: Breguet

Use of Similarity Measure to Suggest the Existence of Duplicate User Stories in the Srum Process

Ricardo Barbosa, Ana Estela Antunes Silva, Regina Moraes (University of Campinas, BR)

Code Change History and Software Vulnerabilities

Marcus Piancò, Balduino Fonseca (Federal University of Alagoas, BR); Nuno Antunes (University of Coimbra, PT)

Tuesday, June 28th, 2016, 11:00 – 12:30

RADIANCE: Cloud and SOA Services

Chair: Marco Vieira (Univ. de Coimbra, PT) - Room: Breguet

External Assessment of QoS Provisioning in Distributed Cloud Services

Kaliappa Ravindran, Arun Adiththan (City University of New York, US); Michael Iannelli (CUNY City College, US), Mohammad Rabby (City University of New York, US)

Hierarchical Model and Sensitivity Analysis for a Cloud-based VoD Streaming Service

Jamilson Ramalho Dantas, Rubens Matos, Jean Araujo, Danilo Oliveira, Andre Oliveira, Paulo Maciel (Federal University of Pernambuco, BR)

SOASales: A SOA System for Research Purposes

Carla Machado, Cristiana Areias, João Carlos Cunha (Instituto Superior de Engenharia de Coimbra, PT)

Tuesday, June 28th, 2016, 14:00 – 15:30

RADIANCE: Keynote

Chair: Eliane Martins (UNICAMP, BR) - Room: Breguet

A Journey towards Rigorous Cybersecurity Experiments

Michel Cukier (University of Maryland, US)

Tuesday, June 28th, 2016, 16:00 – 17:30

RADIANCE: Analysis and Model-based Techniques

Chair: Nuno Antunes (Univ. de Coimbra, PT) - Room: Breguet

A Bayesian Networks Based Method for Ship Reliability Assessment

Hong Dong Wang, Xiao Feng Liang, Hong Yi, Dan Li (Shanghai Jiao Tong University, CN)

Scalable Robustness

Thomas B. Jones, David H. Ackley (University of New Mexico, US)

D-MBTDD: An Approach for Reusing Test Artefacts in Evolving Systems

Thaís Harumi Ussami, Eliane Martins (University of Campinas, BR); Leonardo Montecchi (University of Florence, IT)

SSIV 2016 Workshop

The 2nd International Workshop on Safety and Security of Intelligent Vehicles

Tuesday, June 28th, 2016, 09:00 – 10:30

SSIV: Challenges and Architectural Solutions Chair: António Casimiro (Universidade de Lisboa, PT) - Room: Costes
Welcome
Challenges in Autonomous Vehicle Testing and Deployment Phil Koopman (CMU, US)
In Vehicle Real-Time Fog Computing Hermann Kopetz (TU Wien, AT), Stefan Poledna (TTTech, AT)

Tuesday, June 28th, 2016, 11:00 – 12:30

SSIV: Communication Safety and Security Chair: Xueyi Zou (University of York, UK) - Room: Costes
An Effective Two-Level Redundancy Approach for FlexRay Network Systems Yung-Yuan Chen, Kuen-Long Leu (National Taipei University, TW)
Designing Security for in-vehicle Networks: a Body Control Module (BCM) Centered Viewpoint Bogdan Groza, Horatiu-Eugen Gurban, Pal-Stefan Murvay (Politehnica University of Timisoara, RO)
IEEE 802.11n vs. IEEE 802.15.4: a Study on Communication QoS to provide Safe FANETs Emerson Marconato (ICMC/USP, BR), Jean Aimé Maxa (ENAC, FR), Daniel F. Pigatto (ICMC/USP, BR), Alex S.R. Pinto (UFSC, BR), Nicolas Larrieu (ENAC, FR), Kalinka R.L.J. Castelo Branco (ICMC/USP, BR)

Tuesday, June 28th, 2016, 14:00 – 15:30

SSIV: Design and Validation Chair: João Cunha (Instituto Politécnico de Coimbra, PT) - Room: Costes
Keynote: Model Driven Development of a Secure Routing Protocol for UAANET Nicolas Larrieu (ENAC, FR)
On the Validation of a UAV Collision Avoidance System Developed by Model-Based Optimization: Challenges and a Tentative Partial Solution Xueyi Zou, Rob Alexander, John McDerimid (University of York, UK)
Safety Engineering for Autonomous Vehicles Rasmus Adler, Patrik Feth, Daniel Schneider (Fraunhofer IESE, DE)

Tuesday, June 28th, 2016, 16:00 – 17:30

SSIV: Panel Chair: Marco Vieira (Univ. Coimbra, PT) - Room: Costes
Current Solutions and Research Directions Towards Safety and Security of Intelligent Vehicles Phil Koopman (CMU, US), Nicolas Larrieu (ENAC, FR), Hermann Kopetz (TU Wien, AT)

ReSA4CI 2016 Workshop
The 3rd International Workshop on Reliability and Security
Aspects for Critical Infrastructure

Tuesday, June 28th, 2016, 09:00 – 10:30

RES4CI: Critical Infrastructure Protection
Chair: Ilaria Matteucci (CNR-IIT, IT) - Room: C16

Keynote: Thwarting Cyber Attacks: from Deterring to Adapting
Roberto Baldoni ("La Sapienza" University of Rome, IT)

An Architecture for Semi-Automatic Collaborative Malware Analysis for CIs
Giuseppe Laurenza, Daniele Ucci, Leonardo Aniello, Roberto Baldoni ("La Sapienza" University of Rome, IT)

Tuesday, June 28th, 2016, 11:00 – 12:30

Res4CI: Quantification and Analysis of Complex Systems
Chair: Ilaria Matteucci (CNR-IIT, IT) - Room: C16

Diverse Compiling for Software-Based Recovery of Permanent Faults in COTS Processors
Andrea Höller, Bernhard Spitzer, Tobias Rauter, Johannes Iber, Christian Kreiner (Graz University of Technology, AT)

Quantification and Analysis of Interdependency in Cyber-Physical Systems
Koosha Marashi, Sahra Sedigh Sarvestani, Ali R. Hurson (Missouri University of Science & Technology, US)

On the Feasibility of Distinguishing Between Process Disturbances and Intrusions in Process Control Systems using Multivariate Statistical Process Control
Mikel Iturbe (Mondragon University, SP), José Camacho (University of Granada, SP); Iñaki Garitano, Urko Zurutuza, Roberto Uribeetxeberria (Mondragon University, SP)

DISN 2016 Workshop

The 2nd International Workshop on Dependability Issues on SDN and NFV

Tuesday, June 28th, 2016, 13:30 – 15:00

DISN: Fault-Tolerant Software Defined Networks

Chair: Michael Kreutzer (Fraunhofer SIT, DE) - Room: C16

Ground Control to Major Faults: Towards a Fault Tolerant and Adaptive SDN Control Network
Liron Schiff (Tel Aviv University, IL), Stefan Schmid (Aalborg University, DK), Marco Canini (Universite Catholique de Louvain, BE)

Experience with 3 SDN Controllers in an Enterprise Setting
Zhiyuan Teo, Ken Birman, Robbert van Renesse (Cornell University, US)

Availability Modelling of Software-Defined Backbone Networks

Gianfranco Nencioni, Bjarne E. Helvik (Norwegian University of Science and Technology), NO); Andres Gonzalez (Telenor Research, NO), Poul Heegaard (Norwegian University of Science and Technology, NO), Andrzej Kamisiński (AGH University of Science and Technology, PL)

Tuesday, June 28th, 2016, 15:00 – 15:30

DISN: Keynote

Chair: Elias P. Duarte Jr. (UFPR, BR) - Room: C16

A Data-centric Approach for Scalability and Fault-tolerance of SDN Controllers
Alysson Bessani (University of Lisbon, OT)

Tuesday, June 28th, 2016, 16:00 – 17:30

DISN: Dependable Routing in Software Defined Networks

Chair: Alysson Bessani (Univ. de Lisboa, PT) - Room: C16

Routing-Verification-as-a-Service (RVaaS): Trustworthy Routing Despite Insecure Providers
Liron Schiff (Tel Aviv University, IL), Kashyap Thimmaraju (TU Berlin, DE), Stefan Schmid (Aalborg University, DK)

KAR: Key-for-Any-Route, a Resilient Routing System

Rodolfo R. Gomes, Alextian B. Liberato, Cristina K. Dominicini, Moisés R. N. Ribeiro, Magnos Martinello (Federal University of Espirito Santo, BR)

NetCo: Reliable Routing With Unreliable Routers

Anja Feldmann, Philipp Heyder (TU Berlin, DE), Michael Kreutzer (Fraunhofer SIT, DE), Stefan Schmid (Aalborg University, DK & TU Berlin, DE), Jean-Pierre Seifert (TU Berlin & T-Labs Berlin, DE), Haya Shulman (Fraunhofer SIT, DE), Kashyap Thimmaraju (TU Berlin & T-Labs Berlin, DE), Michael Waidner (Fraunhofer SIT, DE), Jens Sieberg (BSI, DE)

Tuesday, June 28th, 2016, 17:30 – 19:00

Jean-Claude Laprie Session

Chairs: Mohamed Kaâniche, Karama Kanoun (LAAS-CNRS, FR); Paulo Verissimo (Univ. Luxembourg, LU) -
Room: Bellonte

Welcome

A short bio of Jean-Claude Laprie

Presentation of the 2016 Jean-Laprie awards

A retrospective of Jean-Claude and of the award

- Brief presentations by previous recipients of 2012-2015 awards
- Brief testimonials about Jean Claude the person and his contributions



Jean-Claude Laprie (1944-2010)

LAAS-CNRS: Founder and Head of the Dependable Computing and Fault Tolerance Research group (1975-1996); Founder and Director of the Laboratory for Dependability Engineering (1992-1996; Director of LAAS (1997-2002) IEEE Computer Society: Chair of the TC on Fault Tolerant Computing (1984-1985) IFIP: Vice-President (2002-2008), Chair of WG 10.4 on Dependable Computing and Fault-Tolerance (1986-1995)

Jean-Claude Laprie was “Directeur de Recherche” at LAAS-CNRS. His career was fully devoted to dependability of computing systems. His contributions to the formulation of the concepts and methodologies of dependability rapidly granted him an international leadership. Jean-Claude was a widely respected leader, a source of inspiration for several young researchers and professionals, and an active member in the FTCS and DSN communities. In particular, he organized the FTCS-8 and FTC23 editions in Toulouse in 1978 and 1993, and the IFIP World Computer Congress in 2004. His exceptional scientific qualities and vision have been recognized by several responsibilities within the IFIP and the IEEE Computer Society, and in France. He received the IFIP Silver Core in 1992, the Silver Medal of the CNRS (The French National Center for Scientific Research) in 1993, and the Grand Prize in Informatics of the French Academy of Sciences in 2009. He was made Chevalier de l’Ordre National du Mérite in 2002.

Jean-Claude Laprie Award

The Jean-Claude Laprie Award in Dependable Computing has been awarded annually since 2012 by the IFIP Working Group 10.4 on Dependable Computing and Fault Tolerance in his honor. The award recognizes outstanding papers that have significantly influenced the theory and/or practice of Dependable Computing. It takes the form of a memorial plaque presented to the author(s) at the Annual IEEE/IFIP International Conference on Dependable Systems and Networks. Any paper relating to dependable and secure computing, and published at least 10 years prior to the award year (e.g., 2006 or earlier for the 2016 award) is eligible for the award.

List of recognized papers

DSN 2016

- W.C. Carter and P.R. Schneider, Design of Dynamically Checked Computers, Proceedings of the IFIP Congress, Vol.2, pp.878 – 883 (1968).
- A. Avizienis, J.C. Laprie, B. Randell and C. Landwehr, Basic Concepts and Taxonomy of Dependable and Secure Computing, IEEE Transactions on Dependable and Secure Computing. Vol.1. No.1, pp.1 - 23 (2004).

DSN 2015

- . L. Hopkins, Jr., T.B. Smith, III and J.H. Lala. "FTMP – A Highly Reliable Fault-Tolerant Multiprocessor for Aircraft". Proceedings of the IEEE, Vol. 66, No. 10, October 1978.

DSN 2014

- B. Randell, "System Structure for Software Fault Tolerance", IEEE Transactions on Software Engineering, vol.SE-1, no.1, 1975, pp 220-232.
- J.H. Wensley, L. Lamport, J. Goldberg, M.W. Green, K.N. Levitt, P.M. Melliar-Smith, R.E. Shostak and C.B. Weinstock, "SIFT: The Design and Analysis of a Fault-Tolerant Computer for Aircraft Control", Proceedings of the IEEE, vol.66, no.10, 1978, pp.1240-1255.
- H. Kopetz and G. Bauer, "The Time-Triggered Architecture", Proceedings of the IEEE, vol.91, no.1, 2003, pp. 112-126

DSN 2013

- L. Lamport, R. Shostak and M. Pease, "The Byzantine Generals Problem", ACM Transactions on Programming Languages and Systems, vol. 4, no. 3, July 1982 pp. 382-401.
- J. Gray, "Why Do Computers Stop and What Can Be Done About It?", In 5th Symposium on Reliability in Distributed Software and Database Systems, pp. 3-12. IEEE, 1986.
- W.G. Bouricius, W.C. Carter and P.R. Schneider, "Reliability Modeling Techniques for Self-Repairing Computer Systems", In 24th ACM National Conference, pp. 295-309, 1969.

DSN 2012

- A. Avizienis, "Design of fault-tolerant computers," in AFIPS Fall Joint Computer Conference, 1967, pp. 733-743
- J. F. Meyer, "On evaluating the performability of degradable computing systems," IEEE Transactions on Computers, vol. C-29, no. 8, pp. 720-731, 1980
- D. A. Patterson, G. Gibson and R. H. Katz, "A case for redundant arrays of inexpensive disks (RAID)," in ACM SIGMOD International Conference on Management of Data, 1988, vol. 17, no. 3, pp. 109-116

Wednesday, June 29th, 2016, 09:00 – 09:30

Welcome
Room: Bellonte

Wednesday, June 29th, 2016, 09:30 – 11:00

Best Paper Candidates

Chair: Domenico Cotroneo (Università di Napoli Federico II, IT) - Room: Bellonte

A Quantitative Methodology for Security Monitor Deployment

Uttam Thakore, Gabriel A. Weaver, William H. Sanders (University of Illinois at Urbana-Champaign, US)

Dynamic Scalable State Machine Replication

Long Hoang Le, Carlos Eduardo Bezerra, Fernando Pedone (University of Lugano, CH)

OSIRIS: Efficient and Consistent Recovery of Compartmentalized Operating Systems

Koustubha Bhat, Dirk Vogt, Erik van der Kouwe, Ben Gras, Lionel Sambuc, Andrew Tanenbaum, Herbert Bos, Cristiano Giuffrida (Vrije University Amsterdam, NL)

Wednesday, June 29th, 2016, 11:30 – 12:30

Session MT1A: Models

Chair: Susanna Donatelli (University of Turin, IT) - Room: Bellonte

Mean Field Approximation of Uncertain Stochastic Models

Luca Bortolussi (University of Trieste, IT), Nicolas Gast (INRIA, FR)

Uncovering Dynamic Fault Trees

Sebastian Junges (RWTH Aachen University, DE), Dennis Guck (University of Twente, NL), Joost-Pieter Katoen (RWTH Aachen University, DE), Mariëlle Stoelinga (University of Twente, NL)

Session MT1B: Practical Experience Reports I

Chair: Andrea Ceccarelli (University of Florence, IT) - Room: Costes

Equipping WAP with WEAPONS to Detect Vulnerabilities

Ibéria Medeiros, Nuno Neves (University of Lisbon, LaSIGE, PT); Miguel Correia (University of Lisbon, INESC-ID, PT)

Characterizing the Consistency of Online Services

Filipe Freitas (ISEL & NOVA LINCS & FCT, UNL, PT), João Leitão (NOVA LINCS & FCT, UNL, PT), Nuno Preguiça (NOVA LINCS & FCT, University of Lisbon, PT), Rodrigo Rodrigues (INESC-ID & IST, University of Lisbon, PT)

Wednesday, June 29th, 2016, 14:00 – 15:30

Session MT2A: Storage Systems

Chair: Karthik Pattabiraman, (University of British Columbia, CA) - Room: Bellonte

Towards a Scalable and Write-free Multi-version Checkpointing Scheme in Solid State Drives
Hoda Aghaei Khouzani, Chengmo Yang (University of Delaware, US)

Elastic Parity Logging for SSD RAID Arrays

Yongkun Li (University of Science and Technology of China, CN); Helen H. W. Chan, Patrick P. C. Lee (The Chinese University of Hong Kong, HK), Yinlong Xu (University of Science and Technology of China, CN)

OI-RAID: A Two-layer RAID Architecture owards Fast Recovery and High Reliability
Neng Wang, Yinlong Xu, Yongkun Li, Si Wu (University of Science and Technology of China, CN)

Session MT2B: Software-Defined Networks

Chair: Catello Di Martino (Bell-Labs - Nokia, US) - Room: Costes

JURY: Validating Controller Actions in Software-Defined Networks

Kshiteej Mahajan (University of Wisconsin, US), Rishabh Poddar (University of California Berkeley, US); Mohan Dhawan, Vijay Mann (IBM Research, US)

SDNShield: Reconciling Configurable Application Permissions for SDN App Markets

Xitao Wen (Northwestern University, US), Bo Yang (Zhejiang University, CN), Yan Chen (Northwestern University, US), Chengchen Hu (Xi'an Jiaotong University, CN); Yi Wang, Bin Liu (Tsinghua University, CN), Xiaolin Chen (Chuxiong Normal University, CN)

Can't Touch This: Consistent Network Updates for Multiple Policies

Szymon Dudycz (Uni Wroclaw, PL), Arne Ludwig (TU Berlin, DE), Stefan Schmid (TU Berlin & T-Labs, DE)

Session MT2C: Anomaly Detection and Exploits

Chair: Will Robertson (Purdue University, US) - Room: Breguet

Kizzle: A Signature Compiler for Detecting Exploit Kits

Ben Stock (CISPA, Saarland University, DE); Benjamin Livshits, Benjamin Zorn (Microsoft Research, US)

A Sharper Sense of Self: Probabilistic Reasoning of Program Behaviors for Anomaly Detection with Context Sensitivity

Kui Xu, Ke Tian, Danfeng (Daphne) Yao, Barbara G. Ryder (Virginia Tech, US)

BAYWATCH: Robust Beaconing Detection to Identify Infected Hosts in Large-Scale Enterprise Networks

Xin Hu (Pinterest, US); Jiyong Jang, Marc Ph. Stoecklin (IBM Research, US), Ting Wang (Lehigh University, US); Douglas L. Schales, Dhilung Kirat, Josyula R. Rao (IBM Research, US)

Wednesday, June 29th, 2016, 16:00 – 17:30

Session MT3A: Data Centers Dependability

Chair: Marcello Cinque (University of Naples Federico II, IT) - Room: Bellonte

Power Capping Aware Checkpointing: On the Interplay Among Power Capping, Temperature, Reliability, Performance and Energy

Kun Tang (Virginia Commonwealth University, US), Devesh Tiwari (Oak Ridge National Laboratory, US), Saurabh Gupta (Oak Ridge National Laboratory, US); Ping Huang, QiQi Lu (Virginia Commonwealth University, US), Christian Engelmann (Oak Ridge National Laboratory, US), Xubin He (Virginia Commonwealth University, US)

Reconsidering Single Failure Recovery in Clustered File Systems

Zhirong Shen, Jiwu Shu (Tsinghua University, CN), Patrick P.C. Lee (The Chinese University of Hong Kong, HK)

Managing Data Center Tickets: Prediction and Active Sizing

Ji Xue (College of William and Mary, US); Robert Birke, Lydia Y. Chen (IBM Research Zurich Lab, CH), Evgenia Smirni (College of William and Mary, US)

Session MT3B: Software Dependability

Chair: Michael Lyu (University of Hong Kong, HK) - Room: Costes

HSFI: Accurate Fault Injection Scalable to Large Code Bases

Erik van der Kouwe, Andrew S. Tanenbaum (Vrije University Amsterdam, NL)

Making Fast Consensus Generally Faster

Sebastiano Peluso, Alexandru Turcu, Roberto Palmieri, Giuliano Losa, Binoy Ravindran (Virginia Tech, US)

ePVF: An Enhanced Program Vulnerability Factor Methodology for Cross-Layer Resilience Analysis

Bo Fang, Qining Lu, Karthik Pattabiraman, Matei Ripeanu (The University of British Columbia, Canada), Sudhanva Gurumurthi (IBM, US)

Session MT3C: Privacy

Chair: Nuno Neves (University of Lisbon, PT) - Room: Breguet

A Privacy Analysis of Google and Yandex Safe Browsing

Thomas Gerbet (Université Joseph Fourier, FR), Amrit Kumar (Université Grenoble Alpes & INRIA, FR), Cédric Lauradoux (INRIA, FR)

PuPPleS: Transformation-Supported Personalized Privacy Preserving Partial Image Sharing

Jianping He, Bin Liu, Deguang Kong, Xuan Bao, Na Wang, Hongxia Jin (Samsung Research America, US), George Kesidis (Penn State, US)

Modeling Privacy and Tradeoffs in Multichannel Secret Sharing Protocols

Devin J. Pohly, Patrick McDaniel (Penn State University, US)

Thursday, June 30th, 2016, 09:00 – 10:00

Keynote: Pascal Andrei, AIRBUS GROUP:

Aircraft Security from the Manufacturer Perspective

Chair: Mohamed Kaàniche (LAAS-CNRS, FR) - Room: Bellonte

Thursday, June 30th, 2016, 10:00 – 10:30

William Carter PhD Dissertation Award in Dependability

Sebastiano Peluso (La Sapienza University of Rome, IT & Instituto Superior Técnico, Lisbon, PT)

Efficient Protocols for Replicated Transactional Systems

Chairs: Doug Blough (Georgia Tech, US) - Paulo Verissimo (Univ. of Luxemburg, LU) - Room: Bellonte

Thursday, June 30th, 2016, 11:00 – 12:30

Session MT4A: Memory and Caches

Chair: Antonio Pecchia (University of Naples Federico II, IT) - Room: Bellonte

Methuselah Flash: Rewriting Codes for Extra-Long Storage Lifetime

Georgios Mappouras, Alireza Vahid, Robert Calderbank, Daniel J. Sorin (Duke University, US)

Enabling Deep Voltage Scaling in Delay Sensitive L1 Caches

Chao Yan, Russ Joseph (Northwestern University, US)

ReadDuo: Constructing Reliable MLC Phase Change Memory through Fast and Robust Readout

Rujia Wang, Youtao Zhang, Jun Yang (University of Pittsburgh, US)

Session MT4B: Cyber-Physical Systems Security

Chair: Felicita Di Giandomenico (CNR, IT) - Room: Costes

On False Data Injection Attacks Against Railway Traction Power Systems

Subhash Lakshminarayana, Zhan Teng Teo, Rui Tan (Advanced Digital Sciences Center, Illinois at Singapore, SG), David K. Y. Yau (Singapore University of Technology and Design, SG), Pablo Arbolea (University of Oviedo, SP)

Targeted Attacks on Teleoperated Surgical Robots: Dynamic Model-based Detection and Mitigation

Homa Alemzadeh, Daniel Chen, Xiao Li, Thenkurussi Kesavadas, Zbigniew T. Kalbarczyk, Ravishankar K. Iyer (University of Illinois at Urbana-Champaign, US)

F-DETA: A Framework for Detecting Electricity Theft Attacks in Smart Grids

Varun Badrinath Krishna, Kiryung Lee, Gabriel A. Weaver, Ravishankar K. Iyer, William H. Sanders (University of Illinois at Urbana-Champaign, US)

Session MT4C: Malware

Chair: Juan Carlos Ruiz (University of Valencia, ES) - Room: Breguet

Repackage-proofing Android Apps

Lannan Luo, Yu Fu, Dinghao Wu, Sencun Zhu, Peng Liu (The Pennsylvania State University, US)

Measuring the Role of Greylisting and Nolisting in Fighting Spam

Fabio Pagani, Matteo De Astis (Universita' degli Studi di Milano, IT); Mariano Graziano (Eurecom and Cisco Systems, Inc.), Andrea Lanzi (Universita' degli Studi di Milano, IT), Davide Balzarotti (Eurecom, FR)

Malware Slums: Measurement and Analysis of Malware on Traffic Exchanges

Salman Yousaf, Umar Iqbal (Lahore University of Management Sciences, PK); Shehroze Farooqi (The University of Iowa, USA), Raza Ahmad (Lahore University of Management Sciences, PK), Zubair Shafiq (The University of Iowa, US), Fareed Zaffar (Lahore University of Management Sciences, PK)

Thursday, June 30th, 2016, 14:00 – 15:30

Session MT5A: Hardware Errors Resiliency

Chair: Zbigniew Kalbarczyk (Univ. of Illinois at Urbana Champaign, US) - Room: Bellonte

Leveraging ECC to Mitigate Read Disturbance, False Reads and Write Faults in STT-RAM

Seyed Mohammad Seyedzadeh (University of Pittsburgh, US), Rakan Maddah (Intel Corporation, US), Alex Jones, Rami Melhem (University of Pittsburgh, US)

SuperGlue: IDL-Based, System-Level Fault Tolerance for Embedded Systems

Jiguo Song, Gedare Bloom, Gabriel Parmer (The George Washington University, US)

PARBOR: An Efficient System-Level Technique to Detect Data Dependent Failures in DRAM

Samira Khan (University of Virginia, US), Donghyuk Lee (Carnegie Mellon University & Nvidia, US), Onur Mutlu (Carnegie Mellon University, US & ETH Zürich, CH)

Session MT5B: Operating Systems Security and Privacy

Chair: Neeraj Suri (University of Darmstadt, DE) - Room: Costes

Secure Identification of Actively Executed Code on a Generic Trusted Component

Bruno Vavala (Carnegie Mellon University, US & University of Lisbon, PT), Nuno Neves (University of Lisbon, PT), Peter Steenkiste (Carnegie Mellon University, US)

Secure and Efficient Multi-variant Execution Using Hardware-assisted Process Virtualization

Koen Koning, Herbert Bos, Cristiano Giuffrida (Vrije University Amsterdam, NL)

Overhaul: Input-Driven Access Control for Better Privacy on Traditional Operating Systems

Kaan Onarlioglu, William Robertson, Engin Kirda (Northeastern University, US)

Session MT5C: Android Security

Chair: Pascal Felber (University of Neuchâtel, CH) - Room: Breguet

Practical, Formal Synthesis and Automatic Enforcement of Security Policies for Android

Hamid Bagheri, Alireza Sadeghi, Reyhaneh Jabbarvand, Sam Malek (University of California Irvine, US)

Don't just BYOD, Bring-Your-Own-App Protection via Virtual Micro Security Perimeters

Gabriel Salles-Loustau, Luis Garcia (Rutgers University, US); Kaustubh Joshi (AT&T Research, US); Saman Zonouz (Rutgers University, US)

Can we Trust the Privacy Policies of Android Apps?

Le Yu, Xiapu Luo, Xule Liu, Tao Zhang (The Hong Kong Polytechnic University, HK)

Friday, July 1st, 2016, 09:00 – 10:00

Keynote: Nicolas Demassieux, Orange Labs, FR
Paving the way for Dependable Software Defined Infrastructures
Chair: Karama Kanoun (LAAS-CNRS, FR) - Room: Bellonte

Friday, July 1st, 2016, 10:00 – 10:30

IEEE Innovation in Societal Infrastructure Award
For the Assessment-driven Design of Trustworthy Cyber Infrastructure for Electrical Systems
William B. Sanders (UIUC, US)
Chair: Doug Blough (Georgia Tech, US) - John Walz (IEEE, US) - Room: Bellonte

Friday, July 1st, 2016, 11:00 – 12:30

Session MT6A: Clouds and Networks

Chair: Paulo Verissimo (Univ. of Luxemburg, LU) - Room: Bellonte

StorM: Enabling Tenant-defined Cloud Storage Middle-box Services

Hui Lu (Purdue University, US), Abhinav Srivastava (AT&T Research, US); Brendan Saltaformaggio, Dongyan Xu (Purdue University, US)

Process-Oriented Non-Intrusive Recovery for Sporadic Operations on the Cloud

Min Fu, Liming Zhu, Ingo Weber, Len Bass, Anna Liu, Xiwei Xu (NICTA, Data61 CSIRO, University of New South Wales, AU)

Network Recovery after Massive Failures

Novella Bartolini, Stefano Ciavarella (University Sapienza of Rome, IT); Thomas F. La Porta (Penn State University, US), Simone Silvestri (Missouri S&T University, US)

Session MT6B: Practical Experience Reports II

Chair: Veena Mendiratta (Bell Labs -Nokia, US) - Room: Costes

ELZAR: Triple Modular Redundancy using Intel AVX (Practical Experience Report)

Dmitrii Kuvaiskii, Oleksii Oleksenko, Pramod Bhatotia (TU Dresden, DE); Pascal Felber (University of Neuchâtel, CH), Christof Fetzer (TU Dresden, DE)

An Evaluation Study on Log Parsing and Its Use in Log Mining

Pinjia He, Jieming Zhu (The Chinese University of Hong Kong, HK), Shilin He (South China University of Technology, CN); Jian Li, Michael R. Lyu (The Chinese University of Hong Kong, HK)

Reliability-Centered Maintenance of the Electrically Insulated Railway Joint via Fault Tree Analysis: A Practical Experience Report

Enno Ruijters, Dennis Guck (University of Twente, NL), Martijn van Noort (ProRail, NL), Marielle Stoelinga (University of Twente, NL)

Best of SELSE

Chair: Alan Wood (Oracle, US) - Room: Examen

A Unified Framework for Error Correction in On-chip Memories

Frederic Sala (UCLA, US), Henry Duwe (UIUC, US), Lara Dolecek (UCLA, US), and Rakesh Kumar (UIUC, US)

Software-Defined Error-Correcting Codes

Mark Gottscho, Clayton Schoeny, Lara Dolecek, and Puneet Gupta (UCLA, US)

CLEAR: Cross-Layer Exploration for Architecting Resilience - Combining Hardware and Software Techniques to Tolerate Soft Errors in Processor Cores

Eric Cheng, Shahrzad Mirkhani (Stanford, US); Lukasz Szafaryn (U. Virginia, US), Chen-Yong Cher (IBM Research, US), Hyungmin Cho (Stanford, US), Kevin Skadron, Mircea Stan (U. Virginia, US); Klas Lilja (Robust Chip, US), Jacob Abraham (UT Austin, US), Pradip Bose (IBM Research, US), and Subhasish Mitra (Stanford, US)

Friday, July 1st, 2016, 11:00 – 12:00

Session MT6C: Encryption and Security vs Performance

Chair: Marco Vieira (Univ. of Coimbra, PT) - Room: Breguet

Balancing Security and Performance for Agility in Dynamic Threat Environments

Michael L. Winterrose, Kevin M. Carter, Neil Wagner, William W. Streilein (MIT Lincoln Laboratory, US)

Rekeying for Encrypted Deduplication Storage

Jingwei Li, Chuan Qin, Patrick P.C. Lee (The Chinese University of Hong Kong, HK), Jin Li (Guangzhou University, CN)

Friday, July 1st, 2016, 14:00 – 15:30

Session MT7A: Dependability Applications

Chair: Christof Fetzer (TU Dresden, DE) - Room: Bellonte

Efficient Algorithm-Based Fault Tolerance for Sparse Matrix Operations

Alexander Schöll, Claus Braun, Michael A. Kochte, Hans-Joachim Wunderlich (University of Stuttgart, DE)

Formal Analysis for Dependable Supervisory Control and Data Acquisition in Smart Grids

Mohammad Ashiqur Rahman (Tennessee Tech University, US), A H M Jakaria (BUET), Ehab Al-Shaer (UNC Charlotte, US)

A Model-Based Approach to Support Safety-Related Decisions in the Petroleum Domain

Leonardo Montecchi (Università di Firenze, IT), Atle Refsdal (SINTEF, NW), Paolo Lollini, Andrea Bondavalli (Università di Firenze, IT)

Friday, July 1st, 2016, 14:00 – 15:00

Session MT7B: Passwords

Chair: Emmanuelle Anceaume (IRISA, FR) - Room: Costes

Secure Point-of-Care Medical Diagnostics via Trusted Sensing and Cyto-Coded Passwords

Tuan Le, Gabriel Salles-Loustau, Laleh Najafizadeh, Mehdi Javanmard, Saman Zonouz (Rutgers University, US)

FuzzyPSM: A New Password Strength Meter Using Fuzzy Probabilistic Context-Free Grammars

Ding Wang (Peking University, CN), Debiao He (Wuhan University, CN); Haibo Cheng, Ping Wang (Peking University, CN)

Session MT7C: Network Security

Chair: Jean Arlat (LAAS-CNRS, FR) - Room: Breguet

DomainProfiler: Discovering Domain Names Abused in Future

Daiki Chiba, Takeshi Yagi, Mitsuoaki Akiyama, Toshiki Shibahara, Takeshi Yada (NTT Secure Platform Laboratories, JP); Tatsuya Mori, Shigeki Goto (Waseda University, JP)

FTP: The Forgotten Cloud

Drew Springall, Zakir Durumeric, J. Alex Halderman (University of Michigan, US)

Friday, July 1st, 2016, 15:30 – 16:30

Wrap Up and TC Meeting

Chair: Doug Blough (Georgia Tech, US) - Room: Bellonte

Industrial Track Day

Wednesday, June 29th, 2016, 11:30 – 12:30

Session IT1: Position Papers

Chair: Cristian Constantinescu (AMD, US) - Room: Examens

Welcome Address - Forewords

Cristian Constantinescu (AMD, USA), Jean-Charles Fabre (LAAS-CNRS/INPT, FR)

A Distributed Avionics Communication Network

Paul Boivin Champeaux, David Faura, Marc Gatti, William Terroy (Thales Avionics, FR)

HARP: High Availability Registration Platform for Software Defined Infrastructure

Henry Zhu (CISCO, USA); Sejun Song (University of Missouri, US)

Secure Embedded Hypervisor based Systems for Automotive

Stefaan Sonck Thiebaut, Antonio De Rosa, Ralph Sasse (OpenSynergy, DE)

Software Safety Assessment and Probabilities

Jean-Paul Blanquart, Philippe Baufretton, Jean-Louis Boulanger, Jean-Louis Camus, Cyrille Comar, Hervé Delseny, Jean Gassino, Emmanuel Ledinet, Philippe Quéré, Bertrand Ricque (Embedded France, FR)

Open Discussion

Wednesday, June 29th, 2016, 14:00 – 15:30

Session IT2: Automotive and Aeronautics Systems Engineering

Chair: Philippe Quéré (Renault SA, FR) - Room: Examens

AUTOSAR for Connected and Autonomous Vehicles: The AUTOSAR Adaptive Platform

Simon Fürst (BMW, DE), Markus Bechter (AUTOSAR, DE)

Evaluation of EEE Reliability Prediction Models for Space Applications

S. Bourbouse, JP. Blanquart, JF. Gajewski (AIRBUS D&S, FR), C. Lahorgue (ESA, NL)

An Uncrewed Aerial Vehicle Attack Scenario and Trustworthy Repair Architecture

Kate Highnam, Kevin Angstadt, Kevin Leach, Westley Weimer (U. of Virginia, US), Aaron Paulos (BBN Raytheon, US), Patrick Hurley (Air Force Research Lab Rome, US)

Transformation of Failure Propagation Models into Fault Trees for Safety Evaluation Purposes

Moomen Chaari, Wolfgang Ecker, Bogdan-Andrei Tabacaru (Infineon Technologies and TU Munich, DE), Thomas Kruse, Cristiano Novello (Infineon Technologies, DE)

Open Discussion

Wednesday, June 29th, 2016, 16:00 – 17:30

Session IT3: Security and Resilience

Chair: Juan-Carlos Ruiz (UPV, ES) - Room: Examens

The Concept of a Software-Free Resilience Infrastructure for Cyber-Physical Systems

Algirdas Avizienis, Rimas Avizienis, Audrius Avizienis (Avizienis & Ass. Inc., US)

A System For The Security Protection of Embedded Binary Programs

Jack W. Davidson (Zephyr Software LLC, USA), Jason D. Hiser, Anh Nguyen Tuong (U. of Virginia, US), Clark L. Coleman (Zephyr Software LLC, US), William H. Hawkins (U. of Virginia, US), John C. Knight (U. of Virginia and Dependable Computing LLC, US), Benjamin D. Rodes, Ashlie B. Hocking (Dependable Computing LLC, US)

Trusted Software Repair for System Resiliency

Westley Weimer (U. of Virginia, USA), Stephanie Forrest (U. of New Mexico, USA), Miryung Kim (UCLA, US), Claire Le Goues (CMU, US), Patrick Hurlley (Air Force Research Lab Rome, US)

Resiliency Challenges in Accelerating Carrier-Grade Networks with SDN

Catello Di Martino, Veena Mendiratta, Marina Thottan (Bell Labs – Nokia, US)

Open Discussion

Thursday, June 30th, 2016, 11:00 – 12:30

Session IT4: Computer Architecture and Networks

Chair: Alan Woods (Oracle, US) - Room: Examens

A Triple Core Lock-Step (TCLS) ARM® Cortex®-R5 Processor for Safety-Critical and Ultra-Reliable Applications

Xabier Iturbe, Balaji Venu, Emre Ozer (ARM, UK), Shidhartha Das

Improving DRAM Fault Characterization through Machine Learning

Elisabeth Baseman, Nathan DeBardleben (Los Alamos National Lab, US), Kurt Ferreira (Sandia National Lab, US), Scott Levy (U. of New Mexico, US), Steven Raasch, Vilas Sridharan, Taniya Siddiqua (AMD, US), Qiang Guan (Los Alamos National Lab, US)

Towards Black-Box Anomaly Detection in Virtual Network Functions

Carla Sauvinaud (LAAS-CNRS, FR), Kahina Lazri (Orange Labs, FR), Mohamed Kaâniche, Karama Kanoun (LAAS-CNRS, FR)

Profiling Memory Vulnerability of Big-data Applications

N. Rameshan (UPC, SP and KTH RTI, SE), R. Birke (IBM Research Lab, CH), L. Navarro (UPC, Spain), V. Vlassov (KTH RTI, SE), B. Urgaonkar, L. Y. Chen (IBM Research Lab, CH)

Open Discussion Closing Address

Fast Abstracts Session

Thursday, June 30th, 2016, 14:00 – 15:30

Fast Abstracts

Chair: António Casimiro (Univ. de Lisboa, PT), Room: Examens

Towards Resilient Java Computational Programs

Quyên Nguyen, Arun Sood (George Mason University, USA)

High Performance, Low Cost, and Double Node Upset Tolerant Latch Design

Aibin Yan, Hong Zhong, Zhao lv (Anhui University, CN), Maoxiang Yi, Xiumin Xu, Zhengfeng Huang (Hefei University of Technology, CN)

A Prototype Implementation of a Failure Database for Information Sharing with the General Public. A Case Study on Radiation Risk Information after Fukushima Nuclear Disaster

Koichi Bando (The University of Electro-Communications, JP), Yutaka Matsuno (Nihon University, JP); Yang Ishigaki, Kenji Tanaka (The University of Electro-Communications, JP)

A Fundamental Study on Software Rejuvenation in Time Warp Simulation

Satoshi Fukumoto, Mamoru Ohara (Tokyo Metropolitan Industrial Technology Research Institute, JP)

APAT: An Application of Aggregate Signatures to BGPSEC

Kazuma Tanaka (University of Tsukuba, JP), Naoto Yanai (Osaka University, JP), MasaYuki Okada (Japan Network Information Center, JP); Takashi Nishide, Eiji Okamoto (University of Tsukuba, JP)

Towards Scalable and Dependable Privacy-Preserving Publish/Subscribe Services

Emanuel Onica (Alexandru Ioan Cuza University of Iasi, RO); Pascal Felber, Hugues Mercier, Etienne Rivière (University of Neuchâtel, CH)

BBOBB: A Total Order Broadcast Algorithm Achieving Low Latency and High Throughput

Michel Simatic, Benoit Tellier (Télécom SudParis, FR)

How Secure Industrial Control Systems Need to be? An Approach to Select the «Just Secure Enough».

Isabelle Michard (Schneider Electric, FR)

Reducing Late-Timing Failure at Scale: Straggler Root-Cause Analysis in Cloud Datacenters

Xue Ouyang, Peter Garraghan (University of Leeds, UK); Renyu Yang (Beihang University); Paul Townend, Jie Xu (University of Leeds, UK)

Facing Reliability Requirements for Timely Information Sharing in Future Crisis Management Systems

Marcello Cinque, Domenico Cotroneo, Mario Fiorentino (Consorzio Interuniversitario Nazionale per l'Informatica, IT)

Secure Architecture for VMI-based Dynamic Malware Analysis in the Cloud

Benjamin Taubmann, Hans P. Reiser (University of Passau, DE)

Towards Control of MapReduce Performance and Availability

Sophie Cerf, Mihaly Bereckmeri, Bogdan Robu, Nicolas Marchand (Univ. Grenoble Alpes, FR); Sara Bouchenak (INSA, FR)

Towards Efficient and Robust BFT Protocols

Lucas Peronne (Univ. Grenoble Alpes, FR), Sara Bouchenak (INSA, FR)

Efficient Fault Tolerance using Intel MPX and TSX

Oleksii Oleksenko, Dmitrii Kuvaiskii, Pramod Bhatotia, Christof Fetzer (Technische Universität Dresden, DE); Pascal Felber (University of Neuchâtel, CH)

Cluster Workload Analytics Revisited

Subrata Mitra, Suhas Javagal (Purdue University, USA); Todd Gamblin, Adam Moody (Lawrence Livermore National Laboratory, USA); Stephen Harrell, Saurabh Bagchi (Purdue University, USA)

Relying on Consensus does not Make Bitcoin Safer

Emmanuelle Anceaume (CNRS, FR), Romaric Ludinard (ENSAI, FR), Bruno Sericola (INRIA Rennes, FR)

Student Forum Session

Friday, July 1st, 2016, 14:00 – 15:30

Student Forum

Chair: Robin Berthier (UIUC, US) & Illir Gashi (City U. London, UK) – Room: Examens

Providing Continuous Authentication and Non-Repudiation Security Services

Enrico Schiavone (University of Florence, IT)

Validating Unmanned Aerial Vehicle Sense and Avoid Algorithms with Evolutionary Search

Xueyi Zou, (University of York, UK)

Adaptive Fault Tolerance: Is ROS a Relevant Executive Support?

Matthieu Amy (LAAS-CNRS, Université de Toulouse, FR)

Privacy Enhancing Technologies for Ridesharing

Ulrich Matchi Aïvodji (LAAS-CNRS, Université de Toulouse, FR)

Integrity of Distributed Control Systems

Tobias Rauter (Institute for Technical Informatics, Graz University of Technology, AT)

Tutorials

Tuesday, June 28th, 2016, duration: 4h starting at 11:00

Tutorial 1: Common Safety Method for Risk Evaluation and Assessment (CSM-RA) and Hazard Analysis
Nuno Silva and Francisco Moreira (Critical Software, PT) – Room: B16

Safety systems require accident avoidance. This is covered by application standards, processes, techniques and tools that support the identification, analysis, elimination or reduction to an acceptable level of system risks and hazards. Ideally, a safety system should be free of hazards. However, both industry and academia have been struggling to ensure appropriate risk and hazard analysis, especially in what concerns completeness of the hazards, formalization, and timely analysis in order to influence the specifications and the implementation. This tutorial will provide insights on the fundamentals of CSM-RA based and complemented with Hazard Analysis and when and how to apply them. The relation and similarities of these processes with industry standards and the system life cycles will be highlighted and a specific hands-on session will guide the attendees through several example cases of the application of the CSM-RA, for the railway domain, with the identification and management of the hazards related to the system or system proposed changes.

Tutorial 2: Reliability and Availability Modeling in Practice
Kishor Trivedi (Duke University, US) and Andrea Bobbio (Universita' del Piemonte Orientale, IT) – Room: B18

The diffusion of IT in any area of the human activity requires a high level of dependability of the digital systems, and necessitates the application of accurate modeling techniques. In this tutorial we will expose methods used in reliability, availability, performability and survivability modeling and analysis of systems in practice. Non-state-space solution methods are often used to solve reliability block diagrams, fault trees and reliability graphs. Relatively efficient algorithms are known to handle systems with hundreds of components and have been implemented in many software packages. We will show the usage of these model types through practical examples and via the software package SHARPE. Nevertheless many practical problems cannot be handled by such algorithms. Bounding algorithms are then used in such cases as was done for a major subsystem of Boeing 787. Non-statespace methods derive their efficiency from the independence assumption that is often violated in practice. State space methods based on Markov chains, stochastic Petri nets, semi-Markov and Markov regenerative processes can be used to capture various kinds of dependencies among system components. Markov models, Markov Reward models and stochastic Petri net will be illustrated through practical problems and using the SHARPE software package. However, the resulting state space explosion severely restricts the size of the problem that can be solved. Hierarchical and fixed-point iterative methods provide a scalable alternative that combines the strengths of state space and nonstate-space methods and have been extensively used to solve real-life problems. The use of hierarchical and fixed point iterative methods will be also illustrated via large system examples and the SHARPE software package.

Tuesday, June 28th, 2016, duration: 6h starting at 09:00

Tutorial 3: Activating Protection and Exercising Recovery Against Large-Scale Outages on the Cloud

Hari Govind Ramasamy, Long Wang, Richard Harper and Ruchi Mahindru (IBM Research, US) – Room: B24

The tutorial is designed to be hands-on and will be organized as a full-day activity. First, we will introduce terminology, theory, concepts, and metrics for providing resiliency on a cloud platform. We will catalog factors that make building resilient applications on the cloud easy in some cases and particularly complicated in other cases. The bulk of the tutorial will focus on educating the audience with a series of hands-on exercises, in which they will access a pre-created cloud virtual infrastructure and applications, activate protection against outages at multiple levels of the cloud stack, orchestrate recovery procedure for a simulated site-level outage, and orchestrate failback to the primary site (simulating the reconstruction of the primary site). The hands-on exercises will be tailored to enable audience members to gain a strong grasp of the practical challenges involved in cloud resiliency, e.g., determining recovery priorities based on business criticality, recovery groups, and coordinated recovery across multiple virtual machines constituting a business application. Through the exercises, we will reinforce core design principles and design elements for building resilient cloud applications. We will recap with a survey of commercial and academic solutions and conclude with emerging areas (e.g., container-based resiliency) and future research challenges in cloud resiliency.

Wednesday, June 29th, 2016, duration: 4h30mn starting at 11:30

Tutorial 4: Measuring Resiliency through Field Data: Techniques, Tools and Challenges

Antonio Pecchia (Critiware, IT), Marcello Cinque (University of Naples Federico II, IT) and Veena Mendiratta (Bell Labs – Nokia, US) – Room: B18

Data collected under real workload conditions can provide troves of valuable information about the stresses the systems encounter and their responses to them. Textual/numeric data and log files produced by applications, operating systems, networks, and other monitoring sources play a key role for assessing system reliability. Practitioners, academia, and industry strongly recognize the inherent value of log data. Data-driven evaluation deepens our understanding of the system dependability behavior, and enables stronger design and better monitoring strategies. However, in spite of recent advances, data-driven reliability evaluation keeps posing challenging questions due to the scale, complexity and diversity of applications. This full-day tutorial focuses on methodologies, tools and state-of-the-art techniques underlying data-driven system reliability evaluation. The goal of the tutorial is to deliver a well-balanced mix of theory and practice by (i) introducing state-of-the-art techniques to characterize and model failure data starting from data, (ii) presenting industrial case studies and assessments of real-world systems (iii) providing exciting hands-on sessions where attendees will be guided in the analysis of a real log data. Research issues and novel directions will be introduced during the tutorial to foster the discussion among attendees.

Thursday, June 30th, 2016, duration: 3h30mn starting at 11:00

Tutorial 5: Building Highly-Available Distributed SDN Applications with ONOS

Thomas Vachuska, Brian O'Connor and Ali Al-Shabibi (OnLABS, US) – Room: B18

ONOS (Open Network Operating System) is a distributed applications platform aimed at building SDN applications for service provider networks. Size and critical nature of these networks dictate that the platform and control applications built atop of it must be resilient to failures, must be scalable and perform fast both in terms of reaction latency and throughput of control operations. In this tutorial, the attendees will implement a distributed ONOS application called BYON (Build Your Own Network). Through hands-on exercises, the audience will get familiar with the ONOS SDK and experience how to implement an ONOS service, a distributed ONOS store, and how to use parts of the CLI and Northbound API provided by the ONOS platform.

Friday, July 1st, 2016, duration: 4h starting at 11:00

Tutorial 6: Resilience for Scientific Computing: From Theory to Practice

Franck Cappello (Argonne National Lab, US) and George Bosilca (University of Tennessee, US) – Room: B18

Resilience becomes a critical issue for large-scale platforms. This tutorial provides a comprehensive survey of fault-tolerant techniques for high-performance computing, with a fair balance between practice and theory. It is organized along four main topics:

- i. An overview of failure types (software/hardware, transient/fail-stop) observed in the field and typical probability distributions (Exponential, Weibull, Log-Normal) used to model failures inter arrival time.
- ii. General-purpose techniques, which include several fault tolerance protocols, replication, prediction and silent error detection;
- iii. Application-specific techniques, such as ABFT for grid-based algorithms or fixed-point convergence for iterative applications.
- iv. Practical deployment of fault tolerant techniques. Relevant examples based on computational solver routines will be protected with a mix of checkpoint-restart and advanced recovery techniques in a hands-on session.

The tutorial is open to all DSN'16 attendees who are interested in the current status and expected promise of Resilience approaches for scientific applications. There are no audience prerequisites: background will be provided for all protocols and probabilistic models. However, basic knowledge of MPI will be helpful for the hands-on session.

Social Events

You should have your badge to attend these events.

June 28, 2016: Welcome reception – ENAC – 19h



June 30: Visit to Aeroscopia Aeronautical Museum – 16h-18h



June 30: Banquet – Domaine de Preissac – 18h30-22h30



How to get to Conference Venue - ENAC

Address:

ENAC, 7 avenue Edouard Belin, 31400 Toulouse

Bus Shuttle

From June 28 to July 1st, a bus transfer is planned from City Center (departure: 1 boulevard de Strasbourg, in front of QUICK restaurant) to ENAC and from ENAC to City Center. Bus departure times:

June 28th: 07:45 June 29th: 08:00 June 30th and July 1st: 08:15

Also, you can get to ENAC as follows.

From downtown, by Metro and Bus

- > Metro line B (towards Ramonville), exit at Faculté de Pharmacie, then either take Tisséo bus 78 (heading to St Orens Lycée) to the «ENAC» stop, or walk from Faculté de Pharmacie (approximate distance: 1 mile, 1,6 km).
- > Metro line A (towards Balma-Gramont), exit at Jolimont and take Tisséo bus 68 (heading to La Terrasse, «ENAC» stop).

From Toulouse-Blagnac airport

By Taxi: 25 mn

Ask for "Complexe scientifique de Rangueil" then ENAC (next to LAAS or CNES)

By Tram + Metro + Bus: 45 min

Take Tram ligne T2 to Palais de justice, then métro ligne B (towards Ramonville), exit at Faculté de Pharmacie, then either take Tisséo bus 78 (heading St Orens Lycée) to the «ENAC» stop, or walk (approximate distance: 1 mile, 1.6 km).

By Bus + Metro: Take the airport shuttle to the city center and stop at Jeanne d'Arc Station (30 mn), then take metro line B (towards Ramonville), exit at Faculté de Pharmacie, then either Take Tisséo bus 78 (heading St Orens Lycée) to the «ENAC» stop, or walk (approximate distance: 1 mile, 1.6 km).

From Matabiau Railway station

By Taxi: 15 mn

Ask for "Complexe scientifique de Rangueil" then ENAC (next to LAAS or CNES)

By Metro: From the railway station, take the tunnel towards the Metro line A, station Marengo-SNCF. Then, go either towards Balma-Gaumont and stop at Jolimont, or towards Mirail Basso-Cambo and stop at Jean-Jaures to take line B towards Ramonville.

Follow indications given for From downtown to ENAC.

By car (from beltway)

Exit 20, direction «Complexe scientifique de Rangueil»

Exit 23, direction «Université Paul Sabatier, Ramonville St-Agne»

Read more about buses and underground (schedule, lines...):

<http://www.tisseo.fr/en/getting-around>



Printed at LAAS-CNRS