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

Tweetmaster
Roberto Natella, Univ. di Napoli Federico II, IT

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Neeraj Suri, TU Darmstadt, DE
Olivier Thonnard, Amadeus, FR
Aad Van Moorsel, Newcastle Univ., GB
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Neeraj Suri, TU Darmstadt, DE
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Charles Lahorgue, ESA, NL
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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 Cukic, 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 Currie, 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
Felícita 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 Luxembourg, LU
Christian Kreiner, Graz University of Technology, AT
Jérémy 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 2\textsuperscript{nd} International Workshop on Safety and Security of Intelligent Vehicles

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

\textbf{Program Committee}
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Christian Betstatter, Univ. Klagenfurt, AT
Daniel Schneider, Fraunhofer, DE
Denis Fernando Wolf, USP, BR
Francesco Rossi, Resiltech, IT
Hermann Kopetz, Univ. Vienna, AT
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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
Luis 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 3\textsuperscript{rd} International Workshop on Reliability and Security Aspects for Critical Infrastructure

\textbf{Chairs}
Silvia Bonomi, University of Rome La Sapienza, IT
Ilaria Matteucci, IIT-CNR, IT

\textbf{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

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<th>Time</th>
<th>Session</th>
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<tr>
<td>08:00 - 09:00</td>
<td>Registration</td>
</tr>
<tr>
<td>09:00 - 11:00</td>
<td><strong>RSDA</strong> Workshop on Reliability and Security Data Analysis</td>
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<tr>
<td>11:00 - 12:30</td>
<td><strong>RADIANCE</strong> Workshop on Recent Advances in the Dependability Assessment of Complex Systems</td>
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<td><strong>Tutorial 3</strong> Activating Protection and Exercising Recovery Against Large-Scale Outages on the Cloud</td>
</tr>
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<td>12:30 - 13:30</td>
<td>Lunch</td>
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<tr>
<td>14:00 - 17:30</td>
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<tr>
<td>17:30 - 21:00</td>
<td>Jean-Claude Laprie Special Session and Reception</td>
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### Wednesday, June 29th

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

<table>
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<tbody>
<tr>
<td>08:00 - 09:00</td>
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<tr>
<td>09:00 - 10:00</td>
<td>Keynote: Pascal Andrei, Airbus Group: «Aircraft Security from the Manufacturer Perspective»</td>
</tr>
<tr>
<td>10:00 - 10:30</td>
<td>William Carter PhD Dissertation Award in Dependability Sebastiano Peluso (La Sapienza University of Rome, IT &amp; Instituto Superior Técnico, Lisbon, PT)</td>
</tr>
<tr>
<td>10:30 - 11:00</td>
<td>Coffee Break</td>
</tr>
</tbody>
</table>
| 11:00 - 12:30 | 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 - 14:00 | Lunch                                                                 |
| 14:00 - 15:30 | 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 - 16:00 | Coffee Break                                                          |
| 16:00 - 22:30 | Visit to Museum & Banquet                                              |

### Friday, July 1st

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>08:00 - 09:00</td>
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<tr>
<td>09:00 - 10:00</td>
<td>Keynote: Nicolas Demassieux, Orange Labs, France: «Paving the Way for Dependable Software Defined Infrastructures»</td>
</tr>
</tbody>
</table>
| 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) |
| 10:30 - 11:00 | Coffee Break                                                          |
| 11:00 - 12:00 | 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 |
| 12:30 - 14:00 | Lunch                                                                 |
| 14:00 - 15:00 | MT7A: Dependability Applications  
 MT7B: Passwords  
 MT7C: Network Security  
 Student Forum  
 Tutorial 6: Resilience for Scientific Computing: From Theory to Practice |
| 15:30 - 16:30 | Wrapup and TC Meeting                                                  |
### RSDA 2016 Workshop

The 3\textsuperscript{rd} International Workshop on Reliability and Security Data Analysis

**Tuesday, June 28\textsuperscript{th}, 2016, 09:00 – 10:30**

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

**Tuesday, June 28\textsuperscript{th}, 2016, 11:00 – 12:30**

<table>
<thead>
<tr>
<th>RSDA: Internet Threats and Countermeasures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair: Marcello Cinque (Università degli Studi di Napoli Federico II, IT) - Room: C08</td>
</tr>
<tr>
<td>Comparing Detection Capabilities of AntiVirus Products: An Empirical Study with Different Versions of Products from the Same Vendors</td>
</tr>
<tr>
<td>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)</td>
</tr>
<tr>
<td>An Application of Unsupervised Fraud Detection to Passenger Name Records</td>
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<tr>
<td>Remi Domingues, Francesco Buonara, Romain Senesi, Olivier Thonnard (Amadeus, FR)</td>
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<tr>
<td>MimeoDroid: Large Scale Dynamic App Analysis on Cloned Devices via Machine Learning Classifiers</td>
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<td>Parvez Faruki (Govt. MCA College, IN), Akka Zemmari (Université de Bordeaux, FR), Manoj Singh Gaur, Vijay Laxmi (Malaviya National Institute of Technology, IN), Mauro Conti</td>
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<td>Error Monitoring for Legacy Mission-Critical Systems</td>
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<td>Marcello Cinque, Raffaele Della Corte, Stefano Russo (Università degli studi di Napoli Federico II, IT)</td>
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<td>SDC is in the Eye of the Beholder: A Survey and Preliminary Study</td>
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<td>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)</td>
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<td>Colin S. Murray (Air Force Research Laboratory, US)</td>
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<td>Hunting Killer Tasks for Cloud System Through Behavior Pattern Learning</td>
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<td>Hongyan Tang, Ying Li, Tong Jia, Zhonghai Wu (Peking University, CN)</td>
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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 Piancó, Baldoino 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, Cristina 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

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<td>Yung-Yuan Chen, Kuen-Long Leu (National Taipei University, TW)</td>
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<td>Designing Security for in-vehicle Networks: a Body Control Module (BCM) Centered Viewpoint</td>
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<td>IEEE 802.11n vs. IEEE 802.15.4: a Study on Communication QoS to provide Safe FANETs</td>
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<td>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)</td>
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<td>Safety Engineering for Autonomous Vehicles</td>
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<td>Phil Koopman (CMU, US), Nicolas Larrieu (ENAC, FR), Hermann Kopetz (TU Wien, AT)</td>
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## Res4CI: Critical Infrastructure Protection

**Chair:** Ilaria Matteucci (CNR-IIT, IT) - **Room:** C16

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

#### 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)

## Res4CI: Quantification and Analysis of Complex Systems

**Chair:** Ilaria Matteucci (CNR-IIT, IT) - **Room:** C16

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

#### 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)

Mikel Iturbe (Mondragon University, SP), José Camacho (University of Granada, SP); Iñaki Garitano, Urko Zurutuza, Roberto Uribeetxeberria (Mondragon University, SP)
## DISN 2016 Workshop
The 2\textsuperscript{nd} International Workshop on Dependability Issues on SDN and NFV

**Tuesday, June 28\textsuperscript{th}, 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 28\textsuperscript{th}, 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 28\textsuperscript{th}, 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) |
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)

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**

**DSN 2015**

**DSN 2014**

**DSN 2013**

**DSN 2012**
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
Íbéra 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

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<td>Towards a Scalable and Write-free Multi-version Checkpointing Scheme in Solid State Drives</td>
<td>Hoda Aghaei Khouzani, Chengmo Yang (University of Delaware, US)</td>
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<td>Elastic Parity Logging for SSD RAID Arrays</td>
<td>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)</td>
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<td>OI-RAID: A Two-layer RAID Architecture towards Fast Recovery and High Reliability</td>
<td>Neng Wang, Yinlong Xu, Yongkun Li, Si Wu (University of Science and Technology of China, CN)</td>
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#### Session MT2B: Software-Defined Networks
Chair: Catello Di Martino (Bell-Labs - Nokia, US) - Room: Costes

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<td>JURY: Validating Controller Actions in Software-Defined Networks</td>
<td>Kshiteej Mahajan (University of Wisconsin, US), Rishabh Poddar (University of California Berkeley, US); Mohan Dhawan, Vijay Mann (IBM Research, US)</td>
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<td>SDNShield: Reconciliating Configurable Application Permissions for SDN App Markets</td>
<td>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)</td>
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<td>Can’t Touch This: Consistent Network Updates for Multiple Policies</td>
<td>Szymon Dudycz (Uni Wroclaw, PL), Arne Ludwig (TU Berlin, DE), Stefan Schmid (TU Berlin &amp; T-Labs, DE)</td>
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#### Session MT2C: Anomaly Detection and Exploits
Chair: Will Robertson (Purdue University, US) - Room: Breguet

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<td>Kizzle: A Signature Compiler for Detecting Exploit Kits</td>
<td>Ben Stock (CISPA, Saarland University, DE); Benjamin Livshits, Benjamin Zorn (Microsoft Research, US)</td>
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<td>A Sharper Sense of Self: Probabilistic Reasoning of Program Behaviors for Anomaly Detection with Context Sensitivity</td>
<td>Kui Xu, Ke Tian, Danfeng (Daphne) Yao, Barbara G. Ryder (Virgina Tech, US)</td>
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<td>BAYWATCH: Robust Beaconing Detection to Identify Infected Hosts in Large-Scale Enterprise Networks</td>
<td>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)</td>
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## 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 F.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)

**PuPPIeS: 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 Kaâniche (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 Arboleya (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, Kiyung 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, Dinh Hao 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 (Università’ degli Studi di Milano, IT), Davide Balzarotti (Eurecom, FR)
Malware Slums: Measurement and Analysis of Malware on Traffic Exchanges
Salman Yousa, Umar Iqbal (Lahore University of Management Sciences, PK); Shehroz 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)
## Session MT5A: Hardware Errors Resiliency

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

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<td>Leveraging ECC to Mitigate Read Disturbance, False Reads and Write</td>
<td>Seyed Mohammad Seyedzadeh (University of Pittsburgh, US), Rakan Maddah (Intel Corporation, US), Alex Jones, Rami Melhem (University of Pittsburgh, US)</td>
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<td>Faults in STT-RAM</td>
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<td>SuperGlue: IDL-Based, System-Level Fault Tolerance for Embedded</td>
<td>Jiguo Song, Gedare Bloom, Gabriel Parmer (The George Washington University, US)</td>
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<td>PARBOR: An Efficient System-Level Technique to Detect Data Dependent</td>
<td>Samira Khan (University of Virginia, US), Donghyuk Lee (Carnegie Mellon University &amp; Nvidia, US), Onur Mutlu (Carnegie Mellon University, US &amp; ETH Zürich, CH)</td>
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## Session MT5B: Operating Systems Security and Privacy

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

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<tr>
<td>Secure Identification of Actively Executed Code on a Generic Trusted</td>
<td>Bruno Vavala (Carnegie Mellon University, US &amp; University of Lisbon, PT), Nuno Neves (University of Lisbon, PT), Peter Steenkiste (Carnegie Mellon University, US)</td>
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<td>Component</td>
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<td>Secure and Efficient Multi-variant Execution Using Hardware-assisted</td>
<td>Koen Koning, Herbert Bos, Cristiano Giuffrida (Vrije University Amsterdam, NL)</td>
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<td>Process Virtualization</td>
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<td>Overhaul: Input-Driven Access Control for Better Privacy on</td>
<td>Kaan Onarlioglu, William Robertson, Engin Kirda (Northeastern University, US)</td>
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<td>Traditional Operating Systems</td>
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## Session MT5C: Android Security

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

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<tr>
<td>Policies for Android</td>
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<td>Don’t just BYOD, Bring-Your-Own-App Protection via Virtual Micro</td>
<td>Gabriel Salles-Loustau, Luis Garcia (Rutgers University, US); Kaustubh Joshi (AT&amp;T Research, US); Saman Zonouz (Rutgers University, US)</td>
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<td>Security Perimeters</td>
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<tr>
<td>Can we Trust the Privacy Policies of Android Apps?</td>
<td>Le Yu, Xiapu Luo, Xule Liu, Tao Zhang (The Hong Kong Polytechnic University, HK)</td>
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## 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 (Practial 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: Examens

- **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)

### Friday, July 1st, 2016, 15:30 – 16:30

**Session MT7C: Network Security**  
Chair: Jean Arlat (LAAS-CNRS, FR) - Room: Breguet

**DomainProfiler: Discovering Domain Names Abused in Future**  
Daiki Chiba, Takeshi Yagi, Mitsuaki 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)

**Wrap Up and TC Meeting**  
Chair: Doug Blough (Georgia Tech, US) - Room: Bellonte
## Industrial Track Day

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

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<td><strong>Chair:</strong> Cristian Constantinescu (AMD, US) - <strong>Room:</strong> Examens</td>
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### 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 Baufreton, Jean-Louis Boulanger, Jean-Louis Camus, Cyrille Comar, Hervé Delseny, Jean Gassino, Emmanuel Ledinot, Philippe Quéré, Bertrand Ricque (Embedded France, FR)

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### Open Discussion

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

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### 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), Č. 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)

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### 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**  

- **A System For The Security Protection of Embedded Binary Programs**  

- **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 Hurley (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 DeBardeleben (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 Sauvanaud (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**
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<tr>
<td>Towards Resilient Java Computational Programs</td>
<td>Quyen Nguyen, Arun Sood (George Mason University, USA)</td>
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<td>High Performance, Low Cost, and Double Node Upset Tolerant Latch Design</td>
<td>Aibin Yan, Hong Zhong, Zhao lv (Anhui University, CN), Maoxiang Yi, Xiumin Xu, Zhengfeng Huang (Hefei University of Technology, CN)</td>
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<td>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</td>
<td>Koichi Bando (The University of Electro-Communications, JP), Yutaka Matsuno (Nihon University, JP); Yang Ishigaki, Kenji Tanaka (The University of Electro-Communications, JP)</td>
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<td>A Fundamental Study on Software Rejuvenation in Time Warp Simulation</td>
<td>Satoshi Fukumoto, Mamoru Ohara (Tokyo Metropolitan Industrial Technology Research Institute, JP)</td>
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<td>APAT: An Application of Aggregate Signatures to BGPSEC</td>
<td>Kazuma Tanaka (University of Tsukuba, JP), Naoto Yanai (Osaka University, JP), MasaYuki Okada (Japan Network Information Center, JP); Takashi Nishiide, Eiji Okamoto (University of Tsukuba, JP)</td>
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<td>Towards Scalable and Dependable Privacy-Preserving Publish/Subscribe Services</td>
<td>Emanuel Onica (Alexandru Ioan Cuza University of Iasi, RO); Pascal Felber, Hugues Mercier, Etienne Riviè re (University of Neuchâtel, CH)</td>
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<tr>
<td>BBOBB: A Total Order Broadcast Algorithm Achieving Low Latency and High Throughput</td>
<td>Michel Simatic, Benoit Tellier (Télécom SudParis, FR)</td>
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<td>How Secure Industrial Control Systems Need to be? An Approach to Select the «Just Secure Enough».</td>
<td>Isabelle Michard (Schneider Electric, FR)</td>
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<td>Reducing Late-Timing Failure at Scale: Straggler Root-Cause Analysis in Cloud Datacenters</td>
<td>Xue Ouyang, Peter Garraghan (University of Leeds, UK); Renyu Yang (Beihang University); Paul Townend, Jie Xu (University of Leeds, UK)</td>
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<td>Facing Reliability Requirements for Timely Information Sharing in Future Crisis Management Systems</td>
<td>Marcello Cinque, Domenico Cotroneo, Mario Fiorentino (Consorzio Interuniversitario Nazionale per l’Informatica, IT)</td>
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<td>Secure Architecture for VMI-based Dynamic Malware Analysis in the Cloud</td>
<td>Benjamin Taubmann, Hans P. Reiser (University of Passau, DE)</td>
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<td>Towards Control of MapReduce Performance and Availability</td>
<td>Sophie Cerf, Mihaly Berekmeri, Bogdan Robu, Nicolas Marchand (Univ. Grenoble Alpes, FR); Sara Bouchenak (INSa, FR)</td>
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<td>Towards Efficient and Robust BFT Protocols</td>
<td>Lucas Peronne (Univ. Grenoble Alpes, FR), Sara Bouchenak (INSa, FR)</td>
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<td>Efficient Fault Tolerance using Intel MPX and TSX</td>
<td>Oleksii Oleksenko, Dmitrii Kuvaiskii, Pramod Bhatotia, Christof Fetzer (Technische Universität Dresden, DE); Pascal Felber (University of Neuchâtel, CH)</td>
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<td>Cluster Workload Analytics Revisited</td>
<td>Subrata Mitra, Suhas Javagal (Purdue University, USA); Todd Gamblin, Adam Moody (Lawrence Livermore National Laboratory, USA); Stephen Harrell, Saurabh Bagchi (Purdue University, USA)</td>
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<td>Relying on Consensus does not Make Bitcoin Safer</td>
<td>Emmanuelle Anceaume (CNRS, FR), Romaric Ludinard (ENSAI, FR), Bruno Sericola (INRIA Rennes, FR)</td>
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## Student Forum Session

**Friday, July 1st, 2016, 14:00 – 15:30**

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<td>Enrico Schiavone (University of Florence, IT)</td>
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<td>Validating Unmanned Aerial Vehicle Sense and Avoid Algorithms with Evolutionary Search</td>
<td>Xueyi Zou, (University of York, UK)</td>
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<td>Adaptive Fault Tolerance: Is ROS a Relevant Executive Support?</td>
<td>Matthieu Amy (LAAS-CNRS, Université de Toulouse, FR)</td>
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<td>Privacy Enhancing Technologies for Ridesharing</td>
<td>Ulrich Matchi Aivodji (LAAS-CNRS, Université de Toulouse, FR)</td>
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<td>Integrity of Distributed Control Systems</td>
<td>Tobias Rauter (Institute for Technical Informatics, Graz University of Technology, AT)</td>
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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 (Università 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

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 Tisseo 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