

# **2015 IEEE 16th International Symposium on High Assurance Systems Engineering**

**(HASE 2015)**

**Daytona Beach, Florida, USA  
8-10 January 2015**



**IEEE Catalog Number: CFP15072-POD  
ISBN: 978-1-4799-8112-0**

# 2015 IEEE 16th International Symposium on High Assurance Systems Engineering

## HASE 2015

### Table of Contents

Welcome Message from the Conference Co-Chairs.....	viii
Organizing Committee.....	ix
Program Committee.....	x
Additional Reviewers.....	xii

---

#### Full Papers

An Object-Oriented Language for Modeling of Hybrid Systems .....	1
<i>Huixing Fang, Huibiao Zhu, and Jianqi Shi</i>	
Effect of User Posture and Device Size on the Performance of Touch-Based Authentication Systems .....	10
<i>Zahid Syed, Jordan Helmick, Sean Banerjee, and Bojan Cukic</i>	
Modeling and Verifying the Ballooning in Xen with CSP .....	18
<i>Luyao Wang, Fengwei Sui, Yanhong Huang, and Huibiao Zhu</i>	
Verilog Synthesis in the Higher-Order Transformation Framework of TL .....	26
<i>Victor Winter and Shiraz Hussain</i>	
Model-Checking and Game theory for Synthesis of Safety Rules .....	36
<i>Mathilde Machin, Fanny Dufossé, Jérémie Guiochet, David Powell, Matthieu Roy, and Hélène Waeslynck</i>	
A Fixed-Point Algorithm for Automated Static Detection of Infinite Loops .....	44
<i>Andreas Ibing and Alexandra Mai</i>	
Formal Foundations for Hierarchical Safety Cases .....	52
<i>Ewen Denney, Ganesh Pai, and Iain Whiteside</i>	
Enabling Decision Support for the Delivery of Real-Time Services .....	60
<i>David McKee, David Webster, and Jie Xu</i>	
Adaptive GC-Aware Load Balancing Strategy for High-Assurance Java Distributed Systems .....	68
<i>A. Omar Portillo-Dominguez, Miao Wang, John Murphy, and Damien Magoni</i>	

Verification for OAuth Using ASLan++ .....	76
<i>Haixing Yan, Huixing Fang, Christian Kuka, and Huibiao Zhu</i>	
Extending Contract theory with Safety Integrity Levels .....	85
<i>Jonas Westman and Mattias Nyberg</i>	
A Methodology to Efficiently Compare Operating System Stability .....	93
<i>Erik Van Der Kouwe, Cristiano Giuffriday, Razvan Ghituletez, and Andrew S. Tanenbaum</i>	
A Game-Theoretical Model for Security Risk Management of Interdependent ICT and Electrical Infrastructures .....	101
<i>Ziad Ismail, Jean Leneutre, David Bateman, and Lin Chen</i>	
Weaving an Assurance Case from Design: A Model-Based Approach .....	110
<i>Richard Hawkins, Ibrahim Habli, Dimitris Kolovos, Richard Paige, and Tim Kelly</i>	
A Proxy Identifier Based on Patterns in Traffic Flows .....	118
<i>Vahid Aghaei-Foroushani and A. Nur Zincir-Heywood</i>	
Deriving Safety Contracts to Support Architecture Design of Safety Critical Systems .....	126
<i>Irfan Slijvo, Omar Jaradat, Iain Bate, and Patrick Graydon</i>	
Strategy-Aware Mitigation Using Markov Games for Dynamic Application-Layer Attacks .....	134
<i>Mahsa Emami-Taba, Mehdi Amoui, and Ladan Tahvildari</i>	
Adaptive Failure Prediction for Computer Systems: A Framework and a Case Study .....	142
<i>Ivano Irrera, Marco Vieira, and Joao Duraes</i>	
Introducing Meta-Requirements for Describing System of Systems .....	150
<i>Andrea Ceccarelli, Marco Mori, Paolo Lollini, and Andrea Bondavalli</i>	
Observation-Level-Driven Formal Modeling .....	158
<i>Atif Mashkoor and Jean-Pierre Jacquot</i>	
Ontology of Secure Service Level Agreement .....	166
<i>Chen-Yu Lee, Krishna M. Kavi, Raymond A. Paul, and Mahadevan Gomathisankaran</i>	
Modeling and Verification for Probabilistic Properties in Software Product Lines .....	173
<i>Genaina N. Rodrigues, Vander Alves, Vinicius Nunes, André Lanna, Maxime Cordy, Pierre-Yves Schobbens, Amir Molzam Sharifloo, and Axel Legay</i>	
MPISE: Symbolic Execution of MPI Programs .....	181
<i>Xianjin Fu, Zhenbang Chen, Yufeng Zhang, Chun Huang, Wei Dong, and Ji Wang</i>	
Executable Models to Support Automated Software FMEA .....	189
<i>Valentina Bonfiglio, Leonardo Montecchi, Francesco Rossi, Paolo Lollini, András Pataricza, and Andrea Bondavalli</i>	
Formalization and Verification of REST Architecture in Viewpoints .....	197
<i>Yiting Tang, Xi Wu, Huibiao Zhu, and Jian Guo</i>	
Modeling and Verifying Google File System .....	207
<i>Bo Li, Mengdi Wang, Yongxin Zhao, Geguang Pu, Huibiao Zhu, and Fu Song</i>	

A Diversity-Based Approach for Communication Integrity in Critical Embedded Systems .....	215
<i>Amira Zammali, Agnan de Bonneval, and Yves Crouzet</i>	
A Calculus for Wireless Sensor Networks from Quality Perspective .....	223
<i>Xi Wu and Huibiao Zhu</i>	
CamAuth: Securing Web Authentication with Camera .....	232
<i>Mengjun Xie, Yanyan Li, Kenji Yoshigoe, Remzi Seker, and Jiang Bian</i>	
There is a Will, There is a Way: A New Mechanism for Traffic Control Based on VTL and VANET .....	240
<i>Jingmin Shi, Chao Peng, Qin Zhu, Pengfei Duan, Yu Bao, and Mengjun Xie</i>	
A Method for Validating Intent Model Behavior in DSVMs .....	247
<i>Karl A. Morris, Peter J. Clarke, Xudong He, Fabio M. Costa, and Mark Allison</i>	
Applying Safety Case Pattern to Generate Assurance Cases for Safety-Critical Systems .....	255
<i>Chung-Ling Lin and Wuwei Shen</i>	
Eclipse vs. Mozilla: A Comparison of Two Large-Scale Open Source Problem Report Repositories .....	263
<i>Sean Banerjee, Jordan Helmick, Zahid Syed, and Bojan Cukic</i>	
<b>Short Papers</b>	
HCPN Modeling for ERTMS Requirements Specification .....	271
<i>Zakaryae Boudi, El Miloudi El Koursi, and Simon Collart-Dutilleul</i>	
The Need for a Confidence View of CPS Support Environments (Fast Abstract) .....	273
<i>Fredrik Asplund, Martin Törngren, Richard Hawkins, and John A. McDermid</i>	
Signal Processing Oriented Approach for Big Data Privacy .....	275
<i>Xiaohua Li and Thomas Yang</i>	
Fidelity and Complexity in Passive Radar Simulations .....	277
<i>William C. Barott, Ted Dabrowski, and Braham Himed</i>	
Using Pairwise Testing to Verify Automatically-Generated Formal Specifications .....	279
<i>Salamah Salamah, Omar Ochoa, and Yadira Jacquez</i>	
<b>Author Index</b> .....	281