

# **2013 IEEE International Systems Conference**

**(SysCon 2013)**

**Orlando, Florida, USA  
15-18 April 2013**



**IEEE Catalog Number: CFP13SYT-POD**  
**ISBN: 978-1-4673-3107-4**

## TABLE OF CONTENTS

Welcome to Orlando for the 2013 IEEE International Systems Conference.....	xxiv
2013 IEEE International Systems Conference Organizing Committee .....	xxv
Featured Speakers.....	xxviii
Exhibitors .....	xxix
2014 IEEE International Systems Conference Call for Papers .....	xxx

Tuesday, April 16

1:30 PM - 3:15 PM

### 2C2 - Research in Systems Engineering

Room: Palm (DEF)

Session Chair: Joseph P. Elm (Carnegie Mellon University, USA)

<b>Shock Propagation in Cascade Systems .....</b>	<b>1</b>
<i>Seung-Ju Lee (Gwangju Institute of Science and Technology, Korea)</i>	
<i>Young-Hun Lim (Gwangju Institute of Science and Technology, Korea)</i>	
<i>Hyo-Sung Ahn (Gwangju Institute of Science and Technology, Korea)</i>	

<b>Quantifying the Effectiveness of Systems Engineering .....</b>	<b>6</b>
<i>Joseph P. Elm (Carnegie Mellon University, USA)</i>	
<i>Dennis R Goldenson (Carnegie Mellon University, USA)</i>	

<b>Framework and rationale for economic considerations in industrial plant business .....</b>	<b>14</b>
<i>Michael Gepp (University Erlangen-Nuremberg &amp; Siemens AG, Germany)</i>	
<i>Michael Amberg (University Erlangen-Nuremberg, Germany)</i>	
<i>Thomas Schäffler (Siemens AG, Germany)</i>	
<i>Stefan Horn (Siemens AG, Germany)</i>	
<i>Jan Vollmar (Siemens AG, Germany)</i>	

1:30 PM - 3:15 PM

### 2C3 - Software Systems Engineering

Room: Poinciana A/B

Session Chair: Andreas Alexander Helmut Schweiger (EADS Deutschland GmbH, Germany)

<b>Using Data Envelopment Analysis for Supplier Evaluation with Environmental Considerations .....</b>	<b>20</b>
<i>Zhe Sun (The University of Hong Kong, Hong Kong)</i>	
<i>T. N. Wong (The University of Hong Kong, Hong Kong)</i>	
<i>Lik Hang Lee (The University of Hong Kong, Hong Kong)</i>	

<b>Applying Software Patterns to Requirements Engineering for Avionics Systems .....</b>	<b>25</b>
<i>Andreas Alexander Helmut Schweiger (EADS Deutschland GmbH, Germany)</i>	

<b>Engineering Graphic User Interfaces with Protected Content .....</b>	<b>31</b>
<i>Abdel Ejnoui (University of South Florida, USA)</i>	
<i>Carlos E. Otero (University of South Florida, USA)</i>	
<i>Abrar Qureshi (The University of Virginia - College at Wise, USA)</i>	

**1:30 PM - 3:15 PM**

**2C4 - Enterprise Systems Engineering I**

**Room:** Poinciana C/D

*Session Chair: Edmon Begoli (Oak Ridge National Laboratory & University of Tennessee, USA)*

**Normative Perspectives on Engineering Systems Design ..... 37**  
*Ali Abbas (University of Illinois at Urbana Champaign, USA)*

**Patterns of Success in Systems Engineering .....43**  
*George Rebovich, Jr. (MITRE Corporation, USA)*  
*Joseph K DeRosa (MITRE Corporation, USA)*

**Scenario-Driven Architecture Assessment Methodology for  
Large Data Analysis Systems ..... 51**  
*Edmon Begoli (Oak Ridge National Laboratory & University of Tennessee, USA)*  
*Theodore Chila (Oak Ridge National Laboratory, USA)*  
*William Inmon (Forest Rim Technology, USA)*

**1:30 PM - 3:15 PM**

**2C5 - Diagnostics, Prognostics, and Enterprise Health Management**

**Room:** Gardenia

*Session Chair: Sifat Islam (Florida Atlantic University, USA)*

**A Prognostic COPD Clinical Support System ..... 56**  
*Ravi Behara (Florida Atlantic University, USA)*  
*Faiz Fattah (Soren Tech, USA)*  
*Piyush Jain (Florida Atlantic University, USA)*  
*Parvathalakshmi Rajadesingh (Florida Atlantic University, USA)*  
*Ankur Agarwal (Florida Atlantic University, USA)*

**Combining PHM Information and System Architecture to  
Support Aircraft Maintenance Planning ..... 60**  
*Felipe Sviaghin Ferri (EMBRAER, Brazil)*  
*Leonardo Ramos Rodrigues (EMBRAER, Brazil)*  
*João Pordeus Gomes (EMBRAER, Brazil)*  
*Ivo Paixão de Medeiros (EMBRAER, Brazil)*  
*Roberto Kawakami Harrop Galvão (Instituto Tecnológico de Aeronáutica, Brazil)*  
*Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)*

**Systemic Capabilities as Emergent Properties: The Source of IT Business Value ..... 66**  
*Guangming Cao (University of Bedfordshire Business School, United Kingdom)*  
*Yanqing Duan (University of Bedfordshire, United Kingdom)*

**1:30 PM - 3:15 PM**

**2C6 - System Safety and Verification**

**Room:** Regency 2

*Session Chair: Christian Schunck (Nestor Laboratory, University of Rome Tor Vergata, Italy)*

**Safety Analysis Integration in a SysML-Based Complex  
System Design Process: a Case Study ..... 70**  
*Faïda Mhenni (SUPMECA, France)*  
*Nga Nguyen (EISTI, France)*  
*Hubert Kadima (EISTI, France)*  
*Jean-Yves Choley (SUPMECA, France)*

<b>A Lightweight Integration of Mutation Analysis With the Model Checker for System Safety Verification .....</b>	<b>76</b>
<i>Manju Nanda (Scientist, India)</i>	
<i>Jayanthi Jagannathan (National Aerospace Laboratories, India)</i>	
<i>Sameer Nayak (Manipal Institute of Technology, India)</i>	
<b>Simulation Based Verification of Concurrent Processing on Security Devices .....</b>	<b>82</b>
<i>Maurizio Talamo (University of Rome Tor Vergata and Nestor Laboratory, Italy)</i>	
<i>Maulahikmah Galinium (University of Rome Tor Vergata, Italy)</i>	
<i>Christian Schunck (Nestor Laboratory, University of Rome Tor Vergata, Italy)</i>	
<i>Franco Arcieri (Nestor Laboratory, University of Rome Tor Vergata, Italy)</i>	
<b>3:30 PM - 5:45 PM</b>	
<b>2D1 - Systems Considerations</b>	
<b>Room:</b> Palm (ABC)	
<i>Session Chair: Jukka Anteroinen (National Defence University of Finland, Finland)</i>	
<b>Towards Policy and Guidelines for the Selection of Computational Engines .....</b>	<b>88</b>
<i>Robert Hernandez (Naval Undersea Warfare Center, USA)</i>	
<i>John Faella (Naval Undersea Warfare Center, USA)</i>	
<b>MIMO-Interference Aware Scheduling Enabling the Allocation of Unbounded Co-channels in Unplanned Networks .....</b>	<b>96</b>
<i>Kranthi Manoj (The University of Texas at San Antonio, USA)</i>	
<i>Brian T Kelley (University of Texas at San Antonio, USA)</i>	
<i>Mohammad Jamshidi (University of Texas at San Antonio, USA)</i>	
<b>The systems concepts in military operations - discussion of critique .....</b>	<b>102</b>
<i>Jukka Anteroinen (National Defence University of Finland, Finland)</i>	
<b>Developing a Systems Thinking Perspective of Hospital Water Sustainability .....</b>	<b>109</b>
<i>Misagh Faezipour (The University of Texas at Arlington, USA)</i>	
<i>Susan Ferreira (The University of Texas at Arlington, USA)</i>	
<b>3:30 PM - 5:45 PM</b>	
<b>2D2 - Special Session on Systems Engineering Case Studies</b>	
<b>Room:</b> Palm (DEF)	
<i>Session Chair: Brian E. White (CAU-SES, USA)</i>	
<b>On the Importance and Value of Case Studies .....</b>	<b>114</b>
<i>Brian E. White (CAU-SES, USA)</i>	
<b>Strategic Architecture Approach To Transforming Defense Acquisition: A Case Study in Moving From Formal Bureaucracy to Lateral Hierarchy .....</b>	<b>123</b>
<i>John Dickmann, Jr. (Sonalysts, Inc., USA)</i>	
<b>Studying regulatory institutions competition and collaboration dynamics in network industries: Using Agent-based Modeling and Simulation .....</b>	<b>131</b>
<i>Hamid R. Darabi (Stevens Institute of Technology, USA)</i>	
<i>Mo Mansouri (Stevens Institute of Technology, USA)</i>	
<b>Elaborating a Conceptual Collaborative Framework: A case Study for Wood Supply Chain in North-Shore Region in Quebec, Canada .....</b>	<b>137</b>
<i>Kyarash Shahriari (CRIQ, Canada)</i>	
<i>Ali G Hessami (Vega Systems &amp; London City University, United Kingdom)</i>	

<b>Biomedical Diagnostic System for Device Coding .....</b>	<b>143</b>
<i>Carlos Alvarez (Florida Atlantic University, USA)</i>	
<i>Destin Smith (Florida Atlantic University, USA)</i>	
<i>Ankur Agarwal (Florida Atlantic University, USA)</i>	

**3:30 PM - 5:45 PM**

**2D3 - Model-Based Systems Engineering**

**Room:** Poinciana A/B

*Session Chair: Carlos C. Insaurralde (Heriot-Watt University, United Kingdom)*

**A Measure of Systems Engineering Effectiveness in Government**

<b>Acquisition of Complex Information Systems .....</b>	<b>147</b>
---	------------

*Steven Doskey (The George Washington University & MITRE Corporation, USA)*

*Thomas Mazzuchi (The George Washington University, USA)*

*Shahram Sarkani (The George Washington University, USA)*

**Exploiting Excessive Resources at Data-centres of Media**

<b>Content Providers Using Cloud Computing .....</b>	<b>153</b>
--	------------

*Amr Alasaad (The University of British Columbia, Canada)*

*Haitham Ahmed (University of British Columbia, Canada)*

*Kaveh Shafiee (The University of British Columbia, Canada)*

*Sathish Gopalakrishnan (University of British Columbia, Canada)*

*Victor CM Leung (The University of British Columbia, Canada)*

<b>Coordination and control for freeway traffic network .....</b>	<b>159</b>
---	------------

*Byeongyeon Kim (Gwangju Institute of Science and Technology, Korea)*

*Hwan Hur (Gwangju Institute of Science and Technology, Korea)*

*Hyo-Sung Ahn (Gwangju Institute of Science and Technology, Korea)*

<b>Model-Merged Development for Analysis and Design of Dependable Software Systems .....</b>	<b>164</b>
--	------------

*Carlos C. Insaurralde (Heriot-Watt University, United Kingdom)*

**3:30 PM - 5:45 PM**

**2D4 - Enterprise Systems Engineering II**

**Room:** Poinciana C/D

*Session Chair: Michael Garcia (ITT Exelis, USA)*

<b>ADS-B System Network Bandwidth and CPU Optimization .....</b>	<b>170</b>
--	------------

*Michael Garcia (ITT Exelis, USA)*

*James Keller (Exelis Inc., USA)*

*James Boughton (Exelis Inc., USA)*

**A Resource Allocation Mechanism Using Coalition Formation and**

<b>The Uncertainty Principle of Game Theory .....</b>	<b>178</b>
---	------------

*Parvathy Pillai (National University of Singapore & International Institute of Informational Technology, Bangalore, Singapore)*

*Shrisha Rao (International Institute of Information Technology, Bangalore, India)*

<b>Functional Collaboration A framework to increase system management efficiency .....</b>	<b>185</b>
--	------------

*Luigino Benetazzo (University of Padova, Italy)*

*Attilio Licciardello (Mida Solutions SrL, Italy)*

*Mauro Franchin (Mida Solutions SrL, Italy)*

*Ronny Tittoto (Mida Solutions SrL, Italy)*

**3:30 PM - 5:45 PM**

**2D5 - Model-based Engineering I**

**Room:** Gardenia

*Session Chair: Ehsan Hosseini (Brunel University, United Kingdom)*

**MOF Compliant Fundamentals for Multi-Domain System Modeling and Simulation ..... 191**

*Tino Jungebloud (Ilmenau University of Technology, Germany)*

*Sven Jäger (Ilmenau University of Technology, Germany)*

*Ralph Maschotta (Ilmenau University of Technology, Germany)*

*Armin Zimmermann (Technische Universität Ilmenau & System and Software Engineering, Germany)*

**Model-Based QoS Evaluation for Embedded Wireless Sensor Networks ..... 195**

*Sven Jäger (Ilmenau University of Technology, Germany)*

*Tino Jungebloud (Ilmenau University of Technology, Germany)*

*Ralph Maschotta (Ilmenau University of Technology, Germany)*

*Armin Zimmermann (Technische Universität Ilmenau & System and Software Engineering, Germany)*

**On the Capability of Human Networks ..... 200**

*Ehsan Hosseini (Brunel University, United Kingdom)*

*Alireza Mousavi (Brunel University, United Kingdom)*

**3:30 PM - 5:45 PM**

**2D6 - Modeling and Simulation I**

**Room:** Regency 2

*Session Chair: Doug Bodner (Georgia Institute of Technology, USA)*

**Early estimation of project performance: the application of a system dynamics rework model ..... 204**

*Thomas Walworth (University of Bristol, United Kingdom)*

*Mike Yearworth (University of Bristol, United Kingdom)*

*Paul Davies (Thales UK & Defence Mission Systems Division, United Kingdom)*

*John Davis (University of Bristol, United Kingdom)*

**On Defining a Domain Specific Multi-Modeling Workflow Language to Address Complex Multi-Modeling Activities ..... 209**

*Ahmed Abu Jbara (George Mason University, USA)*

*Alexander Levis (George Mason University, USA)*

**Multi-Criteria Simulation of Program Outcomes ..... 215**

*Doug Bodner (Georgia Institute of Technology, USA)*

*Jon Wade (Stevens, USA)*

**Bayesian Updating on Price Elasticity of Uncertain Demand ..... 222**

*Zhengwei Sun (University of Illinois at Urbana-Champaign, USA)*

*Ali Abbas (University of Illinois at Urbana-Champaign, USA)*

6:00 PM - 7:00 PM

**Tuesday Reception/Poster Presentations**

Room: Regency 1

<b>Including Affectivity Requirements in Embedded Systems .....</b>	<b>229</b>
<i>Millys Carvalhaes (PUC Goiás, Brazil)</i>	
<i>Olegário da S. Neto (PUC Goiás, Brazil)</i>	
<i>José Ferreira (PUC Goiás, Brazil)</i>	
<i>Adson da Rocha (University of Brasilia, Brazil)</i>	
<i>Talles Marcelo Barbosa (PUC Goiás, Brazil)</i>	
<b>Support for Self-Optimized Organizational Patterns in Socio-Driven Elastic Clouds .....</b>	<b>235</b>
<i>Yasir Karam (Liverpool John Moores University, United Kingdom)</i>	
<i>Thar Baker (Liverpool John Moores University, United Kingdom)</i>	
<i>Azzelerabe Taleb Bendiab (Edith Cowan University, Australia)</i>	
<b>Symmetries, Groups, Groupoids and Systems of Systems .....</b>	<b>244</b>
<i>Eduardo Alonso (City University London, United Kingdom)</i>	
<i>Nicos Karcanias (Assistant Dean of Research, City University, United Kingdom)</i>	
<i>Ali G Hessami (Vega Systems &amp; London City University, United Kingdom)</i>	
<b>IMU-Compensated Image Segmentation for Improved Vision-Based Control Performance.....</b>	<b>251</b>
<i>Peter Karasev (Industrial Perception, Inc. &amp; Georgia Institute of Technology, USA)</i>	
<i>Patricio Vela (Georgia Institute of Technology, USA)</i>	
<i>Allen Tannenbaum (Georgia Institute of Technology, USA)</i>	
<b>Leveraging Semantic Web to Retrieve Customized Medical Information .....</b>	<b>258</b>
<i>Sifat Islam (Florida Atlantic University, USA)</i>	
<i>Glenn Freytag (Shilpico, Inc., USA)</i>	
<i>Ravi Shankar (Florida Atlantic University, USA)</i>	
<b>A PHD approach for multiple vehicle tracking based on a polar detection method in laser range data .....</b>	<b>262</b>
<i>Benoît Fortin (University Lille Nord-de-France, France)</i>	
<i>Régis Lherbier (University Lille Nord-de-France, France)</i>	
<i>Jean-Charles Noyer (University Lille Nord-de-France, France)</i>	
<b>Architectural Design of ARTeMIS: a multi-tasking robot for people with disabilities .....</b>	<b>269</b>
<i>Konstantinos Mykoniatis (University of Central Florida, USA)</i>	
<i>Anastasia Angelopoulou (University of Central Florida &amp; Institute for Simulation and Training, USA)</i>	
<i>Peter Kincaid (University of Central Florida, USA)</i>	
<b>Framework and rationale for economic considerations in industrial plant business .....</b>	<b>B#5</b>
<i>Michael Gepp (University Erlangen-Nuremberg &amp; Siemens AG, Germany)</i>	
<i>Michael Amberg (University Erlangen-Nuremberg, Germany)</i>	
<i>Thomas Schäffler (Siemens AG, Germany)</i>	
<i>Stefan Horn (Siemens AG, Germany)</i>	
<i>Jan Vollmar (Siemens AG, Germany)</i>	
<b>Solar Radiation Prediction Based on Particle Swarm Optimization and Evolutionary Algorithm Using Recurrent Neural Networks .....</b>	<b>280</b>
<i>Nian Zhang (University of the District of Columbia, USA)</i>	

**Wednesday, April 17**

**8:00 AM - 9:45 AM**

**3A1 - Systems Reliability I**

**Room:** Palm (ABC)

*Session Chair: Dr. Radu Babiceanu (University of Arkansas at Little Rock, USA)*

**Use of Ultrasonic Signal Coding and PIR Sensors to Enhance the Sensing Reliability of an Embedded Surveillance System..... 287**

*Y. W. Bai (Fu Jen Catholic University, Taiwan)*  
*Chen-Chien Cheng (Fu Jen Catholic University, Taiwan)*  
*Zi-Li Xie (Fu Jen Catholic University, Taiwan)*

**System Reliability for Wireless Sensor Networks: Computational Modeling and Node Redundancy Optimization ..... B#5**

*Sobhi Mejjaouli (University of Arkansas at Little Rock, USA)*  
*Radu F. Babiceanu (University of Arkansas at Little Rock, USA)*

**A Meta-model for Integrating Safety Concerns into Systems Engineering Processes ..... 298**

*Pierre-Yves Piriou (ENS Cachan, France)*  
*Jean-Marc Faure (ENS Cachan, France)*  
*Gilles Deleuze (EDF R&D, France)*

**8:00 AM - 9:45 AM**

**3A2 - Systems Thinking Benefits I**

**Rooms:** Palm (DEF), Poinciana A/B

*Session Chair: Jeremy Hilton (Cranfield University & Cardiff University, United Kingdom)*

**Systems Engineering for Test: Implementation of Test Strategy & Architecture at Raytheon Missile Systems ..... 305**

*Joe Manas (Raytheon, USA)*  
*Louisa Guise (Raytheon, USA)*

**Improving decision-making and management by thinking about the enterprise through multiple dimensions ..... 312**

*Jeremy Hilton (Cranfield University & Cardiff University, United Kingdom)*  
*Tom Riley (Cranfield University, United Kingdom)*  
*Ivan Mactaggart (Cranfield University, United Kingdom)*  
*Clare Wright (Cardiff University, United Kingdom)*

**Moving from Systematic Treatment to a Systemic Approach A Path for Sustainable U.S. Healthcare ..... 317**

*Peter Whitehead (University of Virginia, USA)*  
*William Scherer (University of Virginia, USA)*



**8:00 AM - 9:45 AM**

**3A3 - Model Based Engineering II**

**Room:** Poinciana A/B

*Session Chair: Jay Thor Turner (Royal Military College of Canada, Canada)*

**Applying Model Based Systems Engineering to NASA's Space Communications Networks ..... 325**

*Kul Bhasin (NASA Glenn Research Center, USA)*

*Patrick Barnes (Vantage Partners LLC., USA)*

*Jessica M Reinert (NASA Glenn Research Center, USA)*

*Bert Golden (NASA Glenn Research Center, USA)*

**Implementation of a Subsumption based Architecture using Model-Driven Development ..... 331**

*Jay Thor Turner (Royal Military College of Canada, Canada)*

*Sidney Givigi (Royal Military College of Canada, Canada)*

*Alain JG Beaulieu (Royal Military College of Canada, Canada)*

**8:00 AM - 9:45 AM**

**3A4 - Systems Verification**

**Room:** Poinciana C/D

*Session Chair: Rai Prasad (Graphic Era University, India)*

**A Simplified New Procedure for Identification of Appliances in Smart Meter Applications ..... 339**

*Rai Prasad (Graphic Era University, India)*

**Ground and Flight Tests of an Innovative Fuel Management System  
in a Twin-Engine Helicopter ..... 345**

*Carlos C. Insaurralde (Heriot-Watt University, United Kingdom)*

*José Girón-Sierra (Universidad Complutense de Madrid, Spain)*

*Santiago Cifuentes (Universidad Complutense de Madrid, Spain)*

*Juan Jimenez (Universidad Complutense de Madrid, Spain)*

**Systems Engineering Processes for Agile Software Development ..... 351**

*Donna Gregorio (MITRE Corporation, USA)*

*Judith S. Dahmann (MITRE Corporation, USA)*

*Pete Modigliani (Author, USA)*

**8:00 AM - 9:45 AM**

**3A5 - Engineering Systems-of-Systems I**

**Room:** Gardenia

*Session Chair: Richard Payne (Newcastle University, United Kingdom)*

**Model-based development of fault tolerant systems of systems ..... 356**

*Zoe Andrews (Newcastle University, United Kingdom)*

*Richard Payne (Newcastle University, United Kingdom)*

*Alexander Romanovsky (Newcastle University, United Kingdom)*

*André LR Didier (Federal University of Pernambuco, Brazil)*

*Alexandre Mota (Universidade Federal de Pernambuco, Brazil)*

**Security Engineering in a System of Systems Environment ..... 364**

*George Rebovich, Jr. (MITRE Corporation, USA)*

*Judith S. Dahmann (MITRE Corporation, USA)*

*Michael McEvelley (MITRE Corporation, USA)*

*Glenda Turner (MITRE Corporation, USA)*

<b>A Novel BER-feedback Power Control Algorithm for Personal Area Network Devices .....</b>	<b>370</b>
<i>Andre Mayers (University of Texas, San Antonio, USA)</i>	
<i>Patrick J Benavidez (University of Texas at San Antonio, USA)</i>	
<i>G. v. S. Raju (University of Texas at San Antonio, USA)</i>	
<i>David Akopian (The University of Texas at San Antonio, USA)</i>	
<i>Mohammad Jamshidi (University of Texas at San Antonio, USA)</i>	

**8:00 AM - 9:45 AM**

**3A6 - Intelligent Robotics**

**Room:** Regency 2

*Session Chair: Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)*

<b>CERBERUS: The development of an intelligent autonomous face recognizing robot .....</b>	<b>376</b>
<i>Konstantinos Mykoniatis (University of Central Florida, USA)</i>	
<i>Anastasia Angelopoulou (University of Central Florida &amp; Institute for Simulation and Training, USA)</i>	
<i>Kristin Schaefer (University of Central Florida, USA)</i>	
<i>Peter Hancock (University of Central Florida, USA)</i>	

<b>Optimized Trajectory Planning of a Robotic Arm Using teaching learning based optimization (TLBO) and artificial bee colony (ABC) optimization techniques .....</b>	<b>381</b>
<i>Vimal Savsani (Pandit Deendayal Petroleum University, INDIA, India)</i>	
<i>Jhala Ramdevsinh Lalubha (Gujarat Technological University &amp; Marwadi Education Foundation Group Of Institute, India)</i>	
<i>Poonam Savsani (PAHER University, India)</i>	

<b>Implementation of a Real-Time Attitude System for the Stabilization Control of a Quad-rotor Robot .....</b>	<b>387</b>
<i>Sergio Ronaldo Barros dos Santos (Instituto Tecnológico de Aeronáutica, Brazil)</i>	
<i>Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)</i>	
<i>Sidney Givigi (Royal Millitary College of Canada, Canada)</i>	
<i>Tiago Mercante (Instituto Tecnológico de Aeronáutica, Brazil)</i>	
<i>Neusa Maria F. Oliveira (Instituto Tecnológico de Aeronautica, Brazil)</i>	

**10:15 AM - 12:00 PM**

**3B1 - Systems Reliability II**

**Room:** Palm (ABC)

*Session Chair: László T. Kóczy (Széchenyi István University, Hungary)*

<b>Improving System Reliability in Optical Networks by Failure Localization Using Evolutionary Optimization .....</b>	<b>394</b>
<i>Krisztian Balazs (Budapest University of Technology and Economics, Hungary)</i>	
<i>Péter Balázs Soproni (Budapest University of Technology and Economics, Hungary)</i>	
<i>Laszlo T. Koczy (Széchenyi István University &amp; Budapest University of Technology and Economics, Hungary)</i>	

<b>A Conceptual Framework for the Continuity of Real-Time Mission-Critical Network Services .....</b>	<b>B#5</b>
<i>Rajiv Kumar (Jaypee University of Information Technology, India)</i>	
<i>Krishna Gopal (Dean, India)</i>	
<i>Sumit Vardhan (Jaypee University of Information Technology, India)</i>	

<b>A Reliability-Based Measurement of Interoperability for Systems of Systems .....</b>	<b>408</b>
<i>Elizabeth A. Jones-Wyatt (Georgia Institute of Technology &amp; Aerospace Systems Design Lab, USA)</i>	
<i>Jean C Domercant (Georgia Institute of Technology &amp; Aerospace Systems Design Laboratory, USA)</i>	
<i>Dimitri Mavris (Georgia Institute of Technology, USA)</i>	

10:15 AM - 12:00 PM

**3B2 - Complex Systems**

**Room:** Palm (DEF)

*Session Chair:* Kaushik Sinha (Massachusetts Institutes of Technology, USA)

**Coupling Structural Complexity Management and System Dynamics to represent the Dynamic Behavior of Product Development Processes ..... 414**

*Daniel Kasperek (Technische Universität München, Germany)*

*Maik Maurer (Technische Universität München & Teseon GmbH, Germany)*

**Towards the Development of a Complex Structural Inspection System Using Small-Scale Aerial Vehicles and Image Processing ..... 420**

*Juan C Avendano (Florida Institute of Technology, USA)*

*Luis Daniel Otero (Florida Institute of Technology, USA)*

*Paul Cosentino (Florida Institute of Technology, USA)*

**A network-based Structural Complexity Metric for Engineered Complex Systems ..... 426**

*Kaushik Sinha (Massachusetts Institute of Technology, USA)*

*Olivier de Weck (Massachusetts Institute of Technology, USA)*

10:15 AM - 12:00 PM

**3B3 - Special Session-Cyber-Physical Systems and Autonomic Management I**

**Room:** Poinciana A/B

*Session Chair:* Carlos C. Insaurralde (Heriot-Watt University, United Kingdom)

**A Snapshot Approach for Applying the Viable System Model in Management Systems ..... 431**

*Thomas Georg Maier (Technische Universität München, Germany)*

*Fatos Elezi (Technische Univeritaet Muenchen, Germany)*

*Udo Lindemann (Technische Universitaet Muenchen, Germany)*

**Using Multiple Perspectives to Design Resilient Systems for Agile Enterprises ..... 437**

*Jeremy Hilton (Cranfield University & Cardiff University, United Kingdom)*

*Tom Riley (Cranfield University, United Kingdom)*

*Clare Wright (Cardiff University, United Kingdom)*

**Modeling and Controlling the Structure of Heterogeneous Mobile Robotic Systems: A BigActor Approach ..... 442**

*Eloi Pereira (University of California, Berkeley & Portuguese Air Force Academy, USA)*

*Camille Potiron (University of California Berkeley, USA)*

*Christoph Kirsch (Universitat Salzburg)*

*Raja Sengupta (University of California Berkeley, USA)*

**Landmark-Based Localization for Unmanned Aerial Vehicles ..... 448**

*Nian Zhang (University of the District of Columbia, USA)*

**10:15 AM - 12:00 PM**

**3B4 - Autonomous Systems**

**Room:** Poinciana C/D

*Session Chair: Paul C. Hershey (Raytheon, Inc., USA)*

**Autonomous Construction of Structures in a Dynamic Environment using Reinforcement Learning ..... 452**  
*Sergio Ronaldo Barros dos Santos (Instituto Tecnológico de Aeronáutica, Brazil)*  
*Sidney Givigi (Royal Military College of Canada, Canada)*  
*Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)*

**Composable, Distributed System to Derive Actionable Mission Information from Intelligence, Surveillance, and Reconnaissance (ISR) Data ..... 460**  
*Paul C. Hershey (Raytheon, Inc., USA)*  
*Mu-Cheng Wang (Raytheon, USA)*

**Autonomous Navigation of a Small Boat using IMU/GPS/Digital Compass Integration ..... 468**  
*Douglas Santos (Instituto Tecnológico de Aeronáutica, Brazil)*  
*Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)*  
*Wagner Cunha (Instituto Tecnológico de Aeronáutica, Brazil)*

**10:15 AM - 12:00 PM**

**3B5 - Engineering Systems-of Systems II**

**Room:** Gardenia

*Session Chair: Paul Grogan (Massachusetts Institute of Technology, USA)*

**Challenges of Integrating NASAs Space Communication Networks ..... 475**  
*Jessica M Reinert (NASA Glenn Research Center, USA)*  
*Patrick Barnes (Vantage Partners LLC., USA)*

**An Integrated Modeling Framework for Infrastructure System-of-systems Simulation ..... 483**  
*Paul Grogan (Massachusetts Institute of Technology, USA)*  
*Olivier de Weck (Massachusetts Institute of Technology, USA)*

**A Criteria-based Framework for Establishing System of Systems Governance ..... 491**  
*Warren K. Vaneman (Naval Postgraduate School, USA)*  
*Roger Jaskot (Space and Naval Warfare Systems Command, USA)*

**10:15 AM - 12:00 PM**

**3B6 - Model-based Engineering**

**Room:** Regency 2

*Session Chair: Sarayut Nonsiri (Aalto University School of Engineering, Finland)*

**Model-Based Approach for Change Propagation Analysis in Requirements ..... 497**  
*Sarayut Nonsiri (Aalto University School of Engineering, Finland)*  
*Eric Coatanea (Aalto University, France)*  
*Mohamed Bakhouya (Aalto University School of Engineering, Finland)*  
*Faisal Mokammel (Aalto University School of Engineering, Finland)*

<b>Rapid Concept Development of the Mission Space Architecture, Process Modeling, and Capability Analysis .....</b>	<b>504</b>
<i>David A Flanigan (The Johns Hopkins University Applied Physics Laboratory, USA)</i>	
<i>Bruce Schneider (The Johns Hopkins University Applied Physics Laboratory, USA)</i>	
<i>Joseph Wolfrom (The Johns Hopkins University Applied Physics Laboratory, USA)</i>	
<b>Quantitative Metrics For Improving Software Performance For An Integrated Tool Platform .....</b>	<b>512</b>
<i>Manju Nanda (Scientist, India)</i>	
<i>Jayanthi Jagannathan (National Aerospace Laboratories, India)</i>	
<i>Chinmayi Jamadagni (Junior Engineer, India)</i>	
<i>Madhan V (Junior Engineer, India)</i>	
<b>1:30 PM - 3:15 PM</b>	
<b>3C1 - Sensors and Systems</b>	
<b>Room:</b> Palm (ABC)	
<i>Session Chair: Alain JG Beaulieu (Royal Military College of Canada, Canada)</i>	
<b>Architecture for multi-camera vision system for automated measurement automotive components .....</b>	<b>520</b>
<i>Romulo Lins (Universidade de Campinas, Brazil)</i>	
<i>Paulo Kurka (University of Campinas, Brazil)</i>	
<b>Systems Approach for the Development of a Silent Wireless Communicator .....</b>	<b>528</b>
<i>Flavio Stasi (Royal Military College of Canada, Canada)</i>	
<i>Rip Pennell (Royal Military College of Canada, Canada)</i>	
<i>Sidney Givigi (Royal Military College of Canada, Canada)</i>	
<i>Alain JG Beaulieu (Royal Military College of Canada, Canada)</i>	
<b>Application of Dempster-Shafer Theory to Task Mapping under Epistemic Uncertainty .....</b>	<b>536</b>
<i>Carsten Uphoff (Technische Universitaet Muenchen, Germany)</i>	
<i>Daniel Mueller-Gritschneider (Technische Universitaet Muenchen, Germany)</i>	
<i>Ulf Schlichtmann (Technische Universität München, Germany)</i>	
<b>1:30 PM - 3:15 PM</b>	
<b>3C2 - Engineering Processes for Complex Systems I</b>	
<b>Room:</b> Palm (DEF)	
<i>Session Chair: TBD</i>	
<b>Embracing Reusable Systems Architecture .....</b>	<b>542</b>
<i>Julie Peirson (Stevens Institute of Technology, USA)</i>	
<i>Richard Turner (Stevens Institute of Technology, USA)</i>	
<i>Bill Williams (The Boeing Company, USA)</i>	
<b>Multiparty Engineering is A Contact Sport .....</b>	<b>546</b>
<i>Philip Barry (The MITRE Corporation &amp; George Mason University, USA)</i>	
<i>Matthew Koehler (The MITRE Corporation, USA)</i>	
<b>Methodology for consideration of system quality within manufacturing .....</b>	<b>553</b>
<i>Matthias Foehr (Siemens AG, Germany)</i>	
<i>Tobias Jäger (Siemens AG, Germany)</i>	
<i>Claudio Turrin (Whirlpool Europe srl, Germany)</i>	
<i>Pierluigi Petrali (Whirlpool Europe srl, Germany)</i>	
<i>Arnaldo Pagani (Whirlpool Europe srl, Germany)</i>	
<i>Paulo Leitao (Polytechnic Institute of Bragança, Germany)</i>	

1:30 PM - 3:15 PM

**3C3 - Special Session-Cyber-Physical Systems and Autonomic Management II**

**Room:** Poinciana A/B

*Session Chair: Carlos C. Insaurralde (Heriot-Watt University, United Kingdom)*

**Cyber-Physical Framework for Early Integration of Autonomous Maritime Capabilities ..... 559**

*Carlos C. Insaurralde (Heriot-Watt University, United Kingdom)*

*Yves Petillot (Heriot-Watt University, United Kingdom)*

**Engineering Change Management Challenges and Management Cybernetics ..... 567**

*Fatos Elezi (Technische Univeritaet Muenchen, Germany)*

*Thomas Georg Maier (Technische Universität München, Germany)*

*Udo Lindemann (Technische Universitaet Muenchen, Germany)*

**Passively adapted and interconnected collision avoidance system design and simulation ..... 574**

*Sung Nam Hwang (Engineering Way Olsson 236 & University of Virginia, USA)*

**Implementing Artificial Awareness with KnowLang ..... 580**

*Emil Jordanov Vassev (Lero - the Irish Software Engineering Research Center, University of Limerick, Ireland)*

*Mike Hinchey (Lero - the Irish Software Engineering Research Center, University of Limerick, Ireland)*

1:30 PM - 3:15 PM

**3C4 - Modeling and Simulation II**

**Room:** Poinciana C/D

*Session Chair: Juan Andres Perez Celis (Centro de Alta Tecnologia & Universidad Nacional Autonoma de Mexico, Mexico)*

**A New Efficient Algorithm for Tracking LEO Satellites ..... 587**

*Ahmad Khanlari (Memorial University of Newfoundland, Canada)*

*Fatemeh Mansourkiaie (Memorial University of Newfoundland, Canada)*

**Methodology for designing highly reliable Fault Tolerance**

**Space Systems based on COTS devices ..... 591**

*Juan Andres Perez Celis (Centro de Alta Tecnologia & Universidad Nacional Autonoma de Mexico, Mexico)*

*Saul de la Rosa Nieves (Centro de Alta Tecnologia School of Engineering National Autonomous University of Mexico, Mexico)*

*Alvar Saenz-Otero (Massachusetts Institute of Technology, USA)*

*Carlos Romo Fuentes (Centro de Alta Tecnologia National Autonomous University of Mexico, Mexico)*

*Saul Daniel Santillan Gutierrez (Centro de Alta Tecnologia School of Engineering National Autonomous University, Mexico)*

**Risk Prediction Model using Fuzzy Regression Method for**

**predicting unplanned hospital admissions ..... 595**

*Manisha Rathi (University of Westminster, United Kingdom)*

**1:30 PM - 3:15 PM**

**3C5 - Engineering Systems-of-Systems III**

**Room:** Gardenia

*Session Chair: Richard Payne (Newcastle University, United Kingdom)*

**Engineering Safe Autonomous Mobile Systems of Systems ..... 599**

*Graham Hellestrand (Embedded Systems Technology Inc., USA)*

**A Method for the Technical Feasibility Assessment of Electrical Vehicle Penetration ..... 606**

*Reem Al Junaibi (Masdar Institute, UAE)*

*Amro Farid (Masdar Institute, UAE)*

**Semi-Formal and Formal Interface Specification for System of Systems Architecture ..... 612**

*Jeremy Bryans (Newcastle University, United Kingdom)*

*Richard Payne (Newcastle University, United Kingdom)*

*Jon Holt (Atego, United Kingdom)*

*Simon Perry (Atego, United Kingdom)*

**3:30 PM - 5:45 PM**

**3D1 - Control Systems and Cyber Security**

**Room:** Palm (ABC)

*Session Chair: Sidney Givigi (Royal Military College of Canada, Canada)*

**Using Multiple Quadrotor Aircraft and Linear Model Predictive Control for the Encirclement of a Target ..... 620**

*Mohamad Iskandarani (Royal Military College of Canada, Canada)*

*Ahmed Hafez (Queen's University, Canada)*

*Sidney Givigi (Royal Military College of Canada, Canada)*

*Alain JG Beaulieu (Royal Military College of Canada, Canada)*

*Camille-Alain Rabbath (Defence R&D Canada, Canada)*

**Layout-Optimized Sorting of Goods with Decentralized Controlled Conveying Modules ..... 628**

*Zäzilia Seibold (Karlsruhe Institute of Technology, Germany)*

*Thomas Stoll (Karlsruhe Institute of Technology, Germany)*

*Kai Furmans (Karlsruhe Institute of Technology, Germany)*

**Assessment of Safety and Security of System Architectures for Cyberphysical Systems ..... 634**

*Nary Subramanian (University of Texas at Tyler, USA)*

*Janusz Zalewski (Florida Gulf Coast University, USA)*

**Architecting an Enhancing Secure Mobility for Data Sensitive Applications ..... B#5**

*Bassam S Farroha (US Department of Defense & Johns Hopkins University - Engineering, USA)*

*Deborah Farroha (US Department of Defense, USA)*

**3:30 PM - 5:45 PM**

**3D2 - Engineering Processes for Complex Systems II**

**Room:** Palm (DEF)

*Session Chair: Alain JG Beaulieu (Royal Military College of Canada, Canada)*

**A systemic approach of quality controls ..... 650**

*Samuel Bassetto (Ecole Polytechnique de Montréal, Canada)*

*Christian Paredes Ioyola (Polytechnique Montreal, Canada)*

*Bertrand Baud-Lavigne (Ecole Polytechnique de Montreal, Canada)*

**ISO26262 Application to Electric Steering Development with a Focus on Hazard Analysis ..... 655**

*Hyungju Kwon (Mobis North America, LLC, USA)*  
*Rachel Itabashi-Campbell (Mobis North America, LLC, USA)*  
*Kevin McLaughlin (Mobis North America, LLC, USA)*

**Detecting Intelligent Agent Behavior with Environment Abstraction in  
Complex Air Combat Systems ..... 662**

*Saurabh Mittal (L3 Communications & Dunip Technologies, USA)*  
*Margery J. Doyle (L3 Communications Link Simulation and Training & Air Force Research Lab, USA)*  
*Eric Watz (Lumir Research, USA)*

**3:30 PM - 5:45 PM**

**3D3 - Special Session- Cyber-Physical Systems and Autonomic Management III**

**Room:** Poinciana A/B

*Session Chair: Carlos C. Insaurralde (Heriot-Watt University, United Kingdom)*

**Simulation of cyber physical models using SysML and numerical solvers ..... 671**

*Eldad Palachi (IBM, Israel)*  
*Takashi Sakairi (IBM Japan, Israel)*  
*Chaim Cohen (IBM, Israel)*

**Linking FMI-based components with discrete event systems ..... 676**

*Wolfgang Mueller (Austrian Institute of Technology, Austria)*  
*Edmund Widl (Austrian Institute of Technology, Austria)*

**Modeling Communication and Estimation Processes of Automated Crash Avoidance Systems ..... 681**

*Ehsan Moradi-Pari (West Virginia University, USA)*  
*Amin Tahmasbi-Sarvestani (West Virginia University, USA)*  
*Yaser P. Fallah (West Virginia University, USA)*

**Joint Route Planning for UAV and Sensor Network for Data Retrieval ..... 688**

*Sujit Baliyarasimhuni (University of Porto - School of Engineering, Portugal)*  
*Daniel E. Lucani (Aalborg University, Denmark)*  
*João Borges de Sousa (Univerty of Porto, Portugal)*

**3:30 PM - 5:45 PM**

**3D4 - Optimization**

**Room:** Poinciana C/D

*Session Chair: Mohamed Ismail (University of Regina, Canada)*

**Optimization of the information chain within the engineering process of production systems ..... 693**

*Matthias Foehr (Siemens AG, Germany)*  
*Adrian Köhlein (Siemens AG, Germany)*  
*Jürgen Elger (Siemens AG, Germany)*  
*Thomas Schäffler (Siemens AG, Germany)*  
*Arndt Lüder (Otto-von-Guericke Universität Magdeburg, Germany)*

**Progressive Modeling: The Emergence of a New Systems Modeling and Optimization Paradigm and its  
Application to the Aggregate Production Planning Problem—Part I ..... B#5**

*Mohamed Ismail (University of Regina, Canada)*

**Progressive Modeling: The Emergence of a New Systems Modeling and Optimization Paradigm and its  
Application to the Aggregate Production Planning Problem Part II ..... B#5**

*Mohamed Ismail (University of Regina, Canada)*



**3:30 PM - 5:45 PM**

**3D5 - System Architecture I**

**Room:** Gardenia

**Session Chair:** *Joakim Fröberg (Mälardalen University, Sweden)*

**A method for analyzing architectural drivers when engineering a system architecture ..... 711**

*Joakim Fröberg (Mälardalen University, Sweden)*

*Stig Larsson (Effective Change AB, Sweden)*

*Per-Åke Nordlander (BAE Systems, Sweden)*

**The use of a Systems Engineering Process Guide to accelerate improvement in Systems Engineering application and expertise ..... 718**

*Andrew Parsley (Rolls-Royce plc, United Kingdom)*

*Charlotte Dunford (University of Bristol, United Kingdom)*

*Darren York (Rolls-Royce plc, United Kingdom)*

*Mike Yearworth (University of Bristol, United Kingdom)*

**Considering Alternative Strategies for Value Sustainment in Systems-of-Systems ..... 725**

*Nicola Ricci (Massachusetts Institute of Technology & Systems Engineering Advancement Research Initiative, USA)*

*Adam M. Ross (Massachusetts Institute of Technology, USA)*

*Donna H. Rhodes (Massachusetts Institute of Technology, USA)*

*Matthew Fitzgerald (Massachusetts Institute of Technology, USA)*

**Thursday, April 18**

**8:00 AM - 9:45 AM**

**4A1 - Product/Project Management**

**Room:** Palm (ABC)

*Session Chair: Carlos C. Insaurrealde (Heriot-Watt University, United Kingdom)*

**Impact Analysis of Graph-based Requirements Models using PageRank Algorithm ..... 731**

*Faisal Mokammel (Aalto University School of Engineering, Finland)*

*Eric Coatanea (Aalto University, France)*

*Mohamed Bakhouya (Aalto University School of Engineering, Finland)*

*Francois Christophe (Aalto University School of Engineering, Finland)*

*Sarayut Nonsiri (Aalto University School of Engineering, Finland)*

**From Research Project Objectives to Milestones by means of Requirements Traceability - Realization of an Autonomous Maritime System ..... 737**

*Carlos C. Insaurrealde (Heriot-Watt University, United Kingdom)*

*Yves Petillot (HWU, United Kingdom)*

**A cybernetic model to understand the context of complex IT Transformation Programs: Overcoming a challenge in current Program Management Frameworks ..... 745**

*Supriya Kummamuru (Tata Consultancy Services, India)*

*Syed W Hussaini (Tata Consultancy Services, India)*

**8:00 AM - 9:45 AM**

**4A2 - Modeling and Simulation III**

**Room:** Palm (DEF)

*Session Chair: Laurent Bousquet (TIMA Laboratory, Grenoble University, France)*

**Object identification and classification in a high resolution satellite data using data mining techniques for knowledge extraction ..... 750**

*Mais Nijim (Texas A&M University, USA)*

*Nikhil Mantrawadi (Texas A&M University - Kingsville, USA)*

**System-level Modeling of Electromechanical Devices With Energy Consumption ..... 756**

*Laurent Bousquet (TIMA Laboratory, Grenoble University, France)*

*Emmanuel Simeu (TIMA Laboratory, Grenoble University, France)*

**Applying Concurrent Engineering on Wing Shape Design with Responsibility Constraints ..... 762**

*Christian Agostinelli (University of Bristol & Airbus Operations Ltd, United Kingdom)*

*Abdul Rampurawala (Airbus Operations Ltd, United Kingdom)*

*Christian Allen (University of Bristol, United Kingdom)*

8:00 AM - 9:45 AM

**4A3 - Biomedical Applications**

Room: Poinciana A/B

Session Chair: Adrian Rusu (Rowan University, USA)

**Mental Tasks Selection Method for a SVM-Based BCI System ..... 767**

Eduardo Iáñez (Miguel Hernández University of Elche, Spain)

Andrés Úbeda (Miguel Hernández University & Biomedical Neuroengineering Group, Spain)

Enrique Hortal (Miguel Hernández University, Spain)

José M. Azorín (Universidad Miguel Hernandez de Elche, Spain)

**Intelligent and Defensive Framework for Decision-Making  
Systems-of-Systems with Applications to Healthcare ..... 772**

Adrian Rusu (Rowan University, USA)

Douglas Taggart (Rowan University, USA)

Kevin Desmond (Rowan University, USA)

Hector Lopez (Rowan University, USA)

**Linear Decoding of 2D Hand Movements for Target Selection  
Tasks Using a Non-Invasive BCI System ..... 778**

Andrés Úbeda (Miguel Hernández University & Biomedical Neuroengineering Group, Spain)

Eduardo Iáñez (Miguel Hernández University of Elche, Spain)

Enrique Hortal (Miguel Hernández University, Spain)

José M. Azorín (Universidad Miguel Hernandez de Elche, Spain)

8:00 AM - 9:45 AM

**4A4 - Systems for the Military**

Room: Poinciana C/D

Session Chair: Joshua Eaton (United States Military Academy, USA)

**Point of Impact: Delivering Mission Essential Supplies to the Warfighter through the  
Joint Precision Airdrop System (JPADS) ..... 783**

Joshua Eaton (United States Military Academy, USA)

**Lessons Learned and Challenges of Developing the NATO  
Air Command and Control Information Services ..... 791**

Leonardo Marcelli Gandolfo (NATO NCI Agency, The Netherlands)

Erica Lindy (NATO NCI Agency, The Netherlands)

Sherri Aker (NATO NCI Agency, The Netherlands)

Christophe Audin (NATO NCI Agency, The Netherlands)

**Modeling the Impact of Maintenance on Naval Fleet Total Ownership Cost..... 801**

Karen Marais (Purdue University, USA)

Jessica Rivas (Purdue University, USA)

Isaac J. Tetzloff (Purdue University, USA)

William Crossley (Purdue University, USA)

**8:00 AM - 9:45 AM**

**4A5 - Critical Systems**

**Room:** Gardenia

*Session Chair: Hitoshi Oi (The University of Aizu, Japan)*

**The Federal Air Marshal Service: Using Value Focused Thinking to Optimize Field Office Allocations ..... 809**

- Mark Castelli (United States Military Academy, USA)*
- Timothy Meier (United States Military Academy, USA)*
- Marquis Morris (United States Military Academy, USA)*
- Mathieu Philie (United States Military Academy, USA)*
- Michael J. Kwinn, Jr. (US Military Academy, USA)*

**Power-Efficiency Study using SPECjEnterprise2010 ..... 812**

- Hitoshi Oi (The University of Aizu, Japan)*
- Sho Niboshi (The University of Aizu, Japan)*

**System Analysis Methods in Emergency Systems' ..... 818**

- Jeffrey McDougall (Florida Institute of Technology, USA)*
- Luis Daniel Otero (Florida Institute of Technology, USA)*
- Juan C Avendano (Florida Institute of Technology, USA)*
- Abdel Ejnoui (University of South Florida, USA)*

**10:00 AM - 11:45 AM**

**4B1 - Agent-Based Engineering and Complex Systems**

**Room:** Palm (ABC)

*Session Chair: Susan Ferreira (The University of Texas at Arlington, USA)*

**Impacts of Land Managers' Decisions on Landuse Transition within Missisquoi Watershed Vermont: An Application of Agent-based Modeling System ..... 824**

- Yushiou Tsai (University of Vermont, USA)*
- Asim Zia (University of Vermont, USA)*
- Christopher Koliba (University of Vermont, USA)*
- Justin Guilbert (Vermont EPSCoR, University of Vermont, USA)*
- Gabriela Bucini (University of Vermont, USA)*
- Brian Beckage (University of Vermont, USA)*

**An Overview of a Multiagent-Based Simulation System for Dynamic Management of Risk Related to Dangerous Goods Transport ..... 830**

- Mohamed Haitam Laarabi (University of Genoa & Mines ParisTech, Italy)*
- Claudio Roncoli (University of Genova, Italy)*
- Roberto Sacile (University of Genova, Italy)*
- Azedine Boulmakoul (Faculté des Sciences Technique de Mohammedia, Morocco)*
- Emmanuel Garbolino (MINES ParisTech, France)*

**Defining and Addressing the Risk of Undesirable Emergent Properties ..... 836**

- Susan Ferreira (The University of Texas at Arlington, USA)*
- Misagh Faezipour (The University of Texas at Arlington, USA)*
- Bill Corley (The University of Texas at Arlington, USA)*

10:00 AM - 11:45 AM

**4B2 - Modeling and Simulation IV**

**Room:** Palm (DEF)

*Session Chair: Rana Haber (Florida Institute of Technology, USA)*

**A Support Vector Machine for Terrain Classification in On-Demand Deployments of Wireless Sensor Networks ..... 841**

*Rana Haber (Florida Institute of Technology, USA)*

*Adrian Peter (Florida Institute of Technology, USA)*

*Carlos E. Otero (University of South Florida, USA)*

*Ivica N. Kostanic (Florida Institute of Technology, USA)*

*Abdel Ejnoui (University of South Florida, USA)*

**Value sensitivity of Quality Function Deployment approaches in systems engineering-driven construction projects ..... 847**

*Jumie Yuventi (Stanford University, USA)*

*Stanley Weiss (Stanford University, USA)*

10:00 AM - 11:45 AM

**4B3 - Systems Engineering**

**Room:** Poinciana A/B

*Session Chair: Dr. Ralph Machotta (Ilmenau University of Technology, Germany)*

**Service Oriented Architecture for Agile Automated Testing Environment ..... 853**

*Michael Weir (Agile-Test Incorporation, USA)*

*Ankur Agarwal (Florida Atlantic University, USA)*

*Ross Kulak (Texas Instruments, USA)*

**A Framework for Agile Development of Simulation-Based System Design Tools..... 861**

*Ralph Maschotta (Ilmenau University of Technology, Germany)*

*Sven Jäger (Ilmenau University of Technology, Germany)*

*Tino Jungebloud (Ilmenau University of Technology, Germany)*

*Armin Zimmermann (Technische Universität Ilmenau & System and Software Engineering, Germany)*

**Reuse of Requirement Traceability Relations for early System Architecture Design ..... B#5**

*Sebastian Maltzahn (Technische Universität Darmstadt, Germany)*

*Reiner Anderl (TU Darmstadt, Germany)*

10:00 AM - 11:45 AM

**4B4 - System Architecture II**

**Room:** Poinciana C/D

*Session Chair: David Allaverdi (Aker Solutions, Norway)*

**A Content Centric Approach to Energy Efficient Data Dissemination ..... 873**

*Peyman TalebiFard (The University of British Columbia, Canada)*

*Hasen Nicanfar (The University of British Columbia, Canada)*

*Victor CM Leung (The University of British Columbia, Canada)*

**A High-Level Architecture Framework for Air Traffic Management (ATM) Operations ..... 878**

*Mark Simons (MITRE, USA)*

*Sarah Stalnaker (MITRE, USA)*

*Constance Morgan (MITRE, USA)*

**Lifecycle perspective on uncertainty and value robustness in the offshore drilling industry ..... 886**

*David Allaverdi (Aker Solutions, Norway)*

*Arne Herberg (Technische Universität München, Germany)*

*Udo Lindemann (Technische Universität München, Germany)*

**10:00 AM - 11:45 AM**

**4B5 - Risk Management of Complex Systems Environments**

**Room:** Gardenia

*Session Chair: Kristian Helmholt (Netherlands Organisation for Applied Scientific Research TNO, The Netherlands)*

**Automation of the SHIELD Methodology for System Hazard Analysis and Resilient Design ..... 894**

*Anthony M Marcus (Florida Atlantic University, USA)*

*Ionut Cardei (Florida Atlantic University, USA)*

*Gabe Alsenas (Florida Atlantic University, USA)*

**Risk Management In Large Scale Underground Infrastructures ..... 902**

*Kristian Helmholt (Netherlands Organisation for Applied Scientific Research TNO, The Netherlands)*

*Wim Courage (Netherlands Organisation for Applied Scientific Research TNO, The Netherlands)*

**Author Index ..... 909**