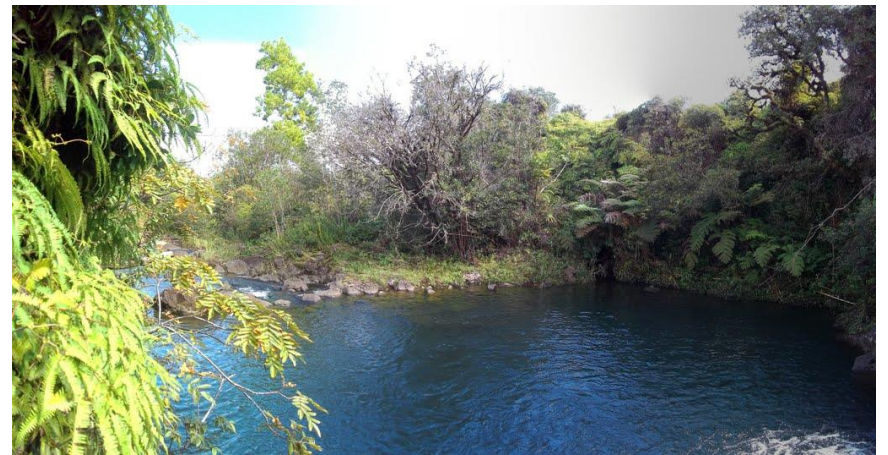




*12th Annual*

# SYSTEM OF SYSTEMS ENGINEERING CONFERENCE



*12th Annual System of Systems Engineering Conference*



Conference Theme:  
"Internet of Things as System of Systems"

June 18-21, 2017

Waikoloa, Hawaii, USA

**SMC**

Reliability Society

**mab**



**RIT**

SUNDAY

4:00p Registration

6:00p Reception

7:00p

MONDAY

07:30 Registration

09:10 Welcome

9:30 Keynote



**Mr. Alan Harding**  
Global Challenges for Systems Engineering and the vital role of SOS Engineering

10:30 Break

10:45

Session

MA\*

MAI @Kings I	MAII @Kings II
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Robotic Systems, UAVs, ROVs, Drones, etc. (A)

Special Session - Systems Governance and Policy

12:00 Lunch



Keynote  
**Prof. Francois Coallier**  
SoSE Challenges in IoT based Systems

2:30p



Keynote  
**Prof. Imre J. Rudas**  
Internet of Anything as a Pillar of Intelligent System of Systems

3:30p Break

3:45p

Session

MP\*

MPI @Kings I	MPII @Kings II
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Robotic Systems, UAVs, ROVs, Drones, etc. (P)

SoSE Simulation, Modeling and Analysis Methods

4:45p

Session

ML\*

MLI @Kings I	MLII @Kings II
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Robotic Systems, UAVs, ROVs, Drones, etc. (P)

SoSE Simulation, Modeling and Analysis Methods

6:00p

5:45p

## ORGANIZING COMMITTEE

### Founding Chair:

- Mo Jamshidi, University of Texas San Antonio, USA

### Conference General Chair:

- Ferat Sahin, Rochester Institute of Technology, USA

### Program Co-Chairs:

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- Ted Shaneyfelt, University of Hawaii at Hilo, USA

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- Tod Schuck, Lockheed Martin, USA

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H Dogan	F Lahboube	G Rebovich	
A Duffy	A Lahmadi	S Reed	

## TUESDAY

07:30	Registration	
08:30	Keynote Dr. John Fumo Implementation of distributed sensing in loosely coupled fabrics	
		
09:30	Keynote Dr. Mark E. Davis IoT Standards	
		
10:30	break	
10:45	TAI @Kings I	TAII @Kings II
Session TA*	Internet of Things / Control	Defense, Space, National Security
12:00	Lunch	
1:30p	Panel I Garry Roedler et. al.	
2:30p	Keynote Prof. Ian Gibson How 3D Printing may change the manufacturing world as we know it	
		
3:30p	Break	
3:45p	TPI @Kings I	TPII @Kings II
Session TP*	Big Data Analytic, Cloud Computing, Service Oriented Architectures	SoSE Architecture, Design and V & V Methods
4:45p	TLI @Kings I	TLII @Kings II
Session TL*	Big Data Analytic, Cloud Computing, Service Oriented Architectures / Enterprise and Business Architecture	SoSE Architecture, Design and V & V Methods
	6:00p	6:00p
7:00p	Banquet	
9:00p		

## WEDNESDAY

07:30	Registration	
08:30	Keynote Prof. Micheal Henshaw Modeling and Simulation for Cyber-Physical Systems	
		
09:30	WAI @ Kings I	WAII @Kings II
Session WA*	Energy, Smart Grid Technologies / SoSE Availability, Maintainability, Reliability, Resilience, Safety	Special Session - Alternative Research Proposals for Engineering Emergence
10:30	Break	
10:45	Panel II Larry Rainey, et. al.	
12:00	Lunch	
1:30p	Keynote Garry Roedler The Future of Systems of Systems – Or is the future here today? Or are we back to the future?	
		
2:30p	WPI @ Kings I	WPII @Kings II
Session WP*	Misc. (Automotive, etc.)	Misc. (Human Centered, etc.)
	3:30p	3:30p

KEYNOTES

MONDAY



MR. ALAN HARDING  
President of INCOSE

Global Challenges for Systems Engineering and the vital role of SOS Engineering



PROF. FRANCOIS COALLIER  
Ecole de Technologie Superieure, Canada

SoSE Challenges in IoT based Systems



PROF. IMRE J. RUDAS  
Óbuda University, Budapest, Hungary

Internet of Anything as a Pillar of Intelligent System of Systems

TUESDAY



DR. JOHN FUMO  
Kona Scientific, Hawaii USA

Implementation of distributed sensing in loosely coupled fabrics

KINGS II ROOM WEDNESDAY JUNE 21ST SESSION WAII CHAIR: TBD

Special Session - Alternative Research Proposals for Engineering Emergence

9:30am The Making of a System of Systems: Ontology Reveals the True Nature of Emergence  
Gary Langford (Portland State University, USA); Teresa Langford (Portland Community College, USA)

Session WAII Paper #1570340366  
Room Kings II

9:45am Practical Modeling Concepts for Engineering Emergence in Systems of Systems  
Kristin Giammarco (Naval Postgraduate School, USA)

Session WAII Paper #1570346500  
Room Kings II

10:00am Emergence as a Subject of Research, Research Methods, and Engineering Knowledge and Practice  
Timothy LJ Ferris (Cranfield University, United Kingdom)

Session WAII Paper #1570345407  
Room Kings II

KINGS II ROOM WEDNESDAY JUNE 21ST SESSION WP11 CHAIR: TBD

Misc. (Human Centered, etc.)

2:30pm Development of Smart Tutor Using XBSH  
Alibek Barlybayev, Talgat Sabyrov and Altanbek Zulfazhah (L. N. Gumilyov Eurasian National University, Kazakhstan); Mo Jamshidi (The University of Texas, USA); Altynbek Sharipbayev (L N Gumilev Eurasian National University, Kazakhstan); Assel Omarbekova (L. N. Gumilyov Eurasian National University, Kazakhstan)

Session WP11 Paper #1570329440  
Room Kings II

2:45pm A System of Systems Approach to Patient Treatment with the Left Ventricular Assist Device  
Viswajith Vasudevan and Marwan A. Simaan (University of Central Florida, USA)

Session WP11 Paper #1570340231  
Room Kings II

3:00pm Human Machine Interface in the Internet of Things (IoT)  
Joseph Nuamah (North Carolina Agricultural and Technical State University, USA); Younho Seong (North Carolina A&T State University, USA)

Session WP11 Paper #1570347159  
Room Kings II

3:15pm Towards an Approach for Analyzing Trust in Cyber-Physical-Social Systems  
Mohamad Gharib, Paolo Lollini and Andrea Bondavalli (University of Florence, Italy)

Session WP11 Paper #1570340931  
Room Kings II

KINGS I ROOM **WEDNESDAY JUNE 21ST** SESSION WAI CHAIR: TBD

Energy, Smart Grid Technologies/ SoSE Availability, Maintainability, Reliability, Resilience, Safety

9:30am **Applying Social Network Analysis to Systems of Systems: The Case of the 2016 Puerto Rico Power Outage**

James Enos (Stevens Institute of Technology); Mo Mansouri (Stevens Institute of Technology, USA); Roshanak Nilchiani (Stevens Institute, USA)

Session WAI Paper #1570339409  
Room Kings I

9:45am **Fresnel Lens-Focused Solar Panel: A New Approach for SHE (Solar-Hydroelectric)**

Mahir Dursun (Gazi University & Faculty of Technology, Turkey); Muhammed Saltuk (Development Bank of Turkey, Turkey)

Session WAI Paper #1570351030  
Room Kings I

10:00am **Systems Architecture in Failure Analysis**

Stephen Rambikur (Naval Post Graduate School & Naval Undersea Warfare Center, USA); Kristin Giammarco (Naval Postgraduate School, USA); Bryan O'Halloran (Naval Post Graduate School, USA)

Session WAI Paper #1570345479  
Room Kings I

10:15am **A Design Flow with Integrated Verification of Requirements and Faults in Safety-Critical Systems**

Wei Yan, Daniel Fontaine, Laurent Michel and John A Chandy (University of Connecticut, USA)

Session WAI Paper #1570344409  
Room Kings I

KINGS I ROOM **WEDNESDAY JUNE 21ST** SESSION WPI CHAIR: TBD

Misc. (Automotive, etc.)

2:30pm **Distributed Data Fusion in the Dempster-Shafer framework**

Orakanya Kanjanatarakul (Chiang Mai Rajabhat University, Thailand); Thierry Denoeux (Université de Technologie de Compiègne, France)

Session WPI Paper #1570344197  
Room Kings I

2:45pm **An Internetworked Self-Driving Car System of Systems**

Jeremy Straub, Wafaa Amer, Christian Ames, Karanam Dayananda, Andrew Jones, Goutham Miryala, Nathan Olson, Noah Rockenback, Franklin Sslaby, Santipab Tipparach, Samuel Fehringer, David Jedynek, Haiming Lou, Dakota Martin, Marc Olberding, Austin Oltmans, Alec Witte, Brady Goenner, Jessie Lee and Dylan Shipman (North Dakota State University, USA)

Session WPI Paper #1570344839  
Room Kings I

3:00pm **Developing the Stakeholder Requirements Definition Process - A Journey of Customization**

Simon Aasheim (HENT AS, Norway); Yang Yang Zhao (University College of Southeast Norway, Norway)

Session WPI Paper #1570335723  
Room Kings I

3:15pm **CyberSecurity Considerations for an Interconnected Self Driving Car System of Systems**

Jeremy Straub, John McMillan, Brett Yaniero, Mitchell Schumacher, Abdullah Almosalami, Kelvin Boatey and Jordan Hartman (North Dakota State University, USA)

Session WPI Paper #1570345560  
Room Kings I

TUESDAY (CONTINUED)

DR. MARK E. DAVIS

Vice President of Platform Engineering Group and Chief Technology Officer of CDMA Products and Development, Intel Corporation

IoT Standards



IAN GIBSON

Professor of Industrial Design & Head of School and School of Engineering Deakin University, Australia

How 3D Printing may change the manufacturing world as we know it



WEDNESDAY

PROF. MICHEAL HENSHAW  
Loughborough University, UK

Modeling and Simulation for Cyber-Physical Systems



GARRY ROEDLER

INCOSE President-Elect, Lockheed Martin Senior Fellow

The Future of Systems of Systems – Or is the future here today? Or are we back to the future?



KINGS I ROOM **MONDAY JUNE 19TH** SESSION MAI CHAIR: TBD

Robotic Systems, UAVs, ROVs, Drones, etc. (1 of 3)	10:45am	<b>A Novel 3D printed leg design for a Biped Robot</b> Matthew Haywood (RIT, USA); Ferat Sahin (Rochester Institute of Technology, USA) Paper #1570346575 Session MAI Room Kings I
	11:00am	<b>A Novel Hexapod Robot Design with Flight Capability</b> Mark Pitonyak and Ferat Sahin (Rochester Institute of Technology, USA) Paper #1570345434 Session MAI Room Kings I
	11:15am	<b>A Framework for an Adaptive Human-Robot Collaboration approach through Perception-based Real-Time adjustments of robot behavior in industry</b> Shitij Kumar and Ferat Sahin (Rochester Institute of Technology, USA) Paper #1570345503 Session MAI Room Kings I
	11:30am	<b>Quadruped Implementation Using Parallel Jointed Leg Architecture</b> Steven Giewont and Ferat Sahin (Rochester Institute of Technology, USA) Paper #1570345421 Session MAI Room Kings I

KINGS I ROOM **MONDAY JUNE 19TH** SESSION MPI CHAIR: TBD

Robotic Systems, UAVs, ROVs, Drones, etc. (2 of 3)	3:45pm	<b>Multi-Pursuer Pursuit-Evasion Games Under Parameters Uncertainty: A Monte Carlo Approach</b> Shahriar Talebi and Marwan A. Simaan (University of Central Florida, USA) Paper #1570340685 Session MPI Room Kings I
	4:00pm	<b>A Deep Vision Landmark Framework for Robot Navigation</b> Abhijith Ravikumar Puthusseray (University of Texas at San Antonio, USA); Karthik Haradi (UTSA, USA); Patrick J Benavidez and Berat A. Erol (University of Texas at San Antonio, USA); Paul Rad (University of Texas San Antonio, USA); Mo Jamshidi (University of Texas at San Antonio) Paper #1570345652 Session MPI Room Kings I
	4:15pm	<b>Improved Route Optimization for Autonomous Ground Vehicle Navigation</b> Ibrahim Mohammed (The University of Texas at San Antonio, USA); Berat A. Erol, Ikram Mohammed and Patrick J Benavidez (University of Texas at San Antonio, USA); Mo Jamshidi (University of Texas at San Antonio) Paper #1570345584 Session MPI Room Kings I
	4:30pm	<b>Development of Robot Operating System (ROS) Compatible Open Source Quadcopter Flight Controller and Interface</b> Abhijit Majumdar, Nicholas Gamez and Patrick J Benavidez (University of Texas at San Antonio, USA); Mo Jamshidi (University of Texas at San Antonio) Paper #1570347307 Session MPI Room Kings I

KINGS II ROOM **TUESDAY JUNE 20TH** SESSION TPII CHAIR: TBD

SoSE Architecture, Design and V & V Methods	3:45pm	<b>Quality metrics for descriptive models in model based systems engineering</b> Ronald Giachetti (Naval Postgraduate School, USA) Paper #1570340808 Session TPII Room Kings II
	4:00pm	<b>Architecture Modeling Software Analytics: Model quality and maturity assessment using automated tools</b> Kristin Giammarco (Naval Postgraduate School, USA) Paper #1570345349 Session TPII Room Kings II
	4:15pm	<b>Comprehensive Use Case Scenario Generation: An Approach for Modeling System of Systems Behaviors</b> Kristin Giammarco, Clifford Whitcomb and Kathleen Giles (Naval Postgraduate School, USA) Paper #1570341061 Session TPII Room Kings II
	4:30pm	<b>Red Teaming in the Age of IOT: Thoughts on Framing the Next Generation of Technical Vulnerability Assessment</b> Richard Craft, II (Sandia National Labs, USA) Paper #1570341050 Session TPII Room Kings II

KINGS II ROOM **TUESDAY JUNE 20TH** SESSION TLII CHAIR: TBD

SoSE Architecture, Design and V & V Methods	4:45pm	<b>On the Emergent Behavior Oxymoron of System-of-Systems Architecture Description</b> Flavio Oquendo (IRISA (UMR CNRS) - University of South Brittany, France) Paper #1570340813 Session TLII Room Kings II
	5:00pm	<b>Architecturally Describing the Emergent Behavior of Software-intensive System-of-Systems with SosADL</b> Flavio Oquendo (IRISA (UMR CNRS) - University of South Brittany, France) Paper #1570340809 Session TLII Room Kings II
	5:15pm	<b>A Novel Methodology for Retrofitting CNC Machines Based on the Context of Industry 4.0</b> Romulo Lins (Faculdade SENAI Mariano Ferraz, Brazil); Robert Schmitt (Laboratory for Machine Tools and Production Engineering WZL, Germany); Bruno Guerreiro (Fraunhofer Institute for Production Technology, Germany); Marcio Corazzim (Faculdade SENAI Mariano Ferraz, Brazil); Francis Silva (Thyssenkrupp, Brazil) Paper #1570340951 Session TLII Room Kings II
	5:30pm	<b>Evaluating a computational support tool for set-based configuration of production systems</b> Johannes Unglert, Sipke Hoekstra and Juan Jauregui-Becker (University of Twente, Faculty of Engineering Technology, Enschede, The Netherlands) Paper #1570340786 Session TLII Room Kings II
5:45pm	<b>A Conceptual Model for Analyzing Information Quality in System-of-Systems</b> Mohamad Gharib, Paolo Lollini and Andrea Bondavalli (University of Florence, Italy) Paper #1570340925 Session TLII Room Kings II	

KINGS I ROOM TUESDAY JUNE 20TH SESSION TPI CHAIR: TBD	
Big Data Analytic, Cloud Computing, Service Oriented Archi. (1 of 2)	<p><b>3:45pm</b> The Internet of Simulation: Enabling Agile Model Based Systems Engineering for Cyber-Physical Systems</p> <p>Stephen Clement and David McKee (University of Leeds, United Kingdom); Richard Romano and Jie Xu (Leeds University, United Kingdom); Jose Lopez (Simware Solutions, Spain); David Battersby (Jaguar Land Rover, United Kingdom)</p> <p>Paper #1570340957 Room Kings I</p>
	<p><b>4:00pm</b> Model-based Assessment of QoS Adaptation in Complex Networked Systems</p> <p>Kaliappa Ravindran and Yassine Wardei (City University of New York, USA); Michael Iannelli (City University of New York (CUNY - City College), USA)</p> <p>Paper #1570344848 Room Kings I</p>
	<p><b>4:15pm</b> Pedestrian Detection System Using Deep Convolutional Neural Networks</p> <p>Jonathan Lwowski, Prasanna Kolar and Patrick J Benavidez (University of Texas at San Antonio, USA); Paul Rad (University of Texas at San Antonio, USA); John J Prevost (University of Texas at San Antonio, USA); Mo Jamshidi (University of Texas at San Antonio)</p> <p>Paper #1570345515 Room Kings I</p>
	<p><b>4:30pm</b> Deep Voice Identification</p> <p>Andrew Boles and Paul Rad (University of Texas San Antonio, USA)</p> <p>Paper #1570345545 Room Kings I</p>
KINGS I ROOM TUESDAY JUNE 20TH SESSION TLI CHAIR: TBD	
Big Data Analytic, Cloud Computing, Svc. Oriented Arch. (2 of 2) / Enterprise and Business Architecture	<p><b>4:45pm</b> Intelligent Tag Retrieval Using Deep Learning of Music Information</p> <p>Sharaj Panwar, Arun Das and Mehdi Roopaei (University of Texas at San Antonio, USA); Paul Rad (University of Texas at San Antonio, USA)</p> <p>Paper #1570345535 Room Kings I</p>
	<p><b>5:00pm</b> Autonomous Decision Making for a Driver-less Car</p> <p>Nicholas Gamez and Nicolas Gallardo (University of Texas at San Antonio, USA); Paul Rad (Rackspace, USA); Mo Jamshidi (University of Texas at San Antonio, USA)</p> <p>Paper #1570341909 Room Kings I</p>
	<p><b>5:15pm</b> Enabling Design of Agile Security in the IOT with MBSE</p> <p>Barry Papke (No Magic Inc, USA)</p> <p>Paper #1570340698 Room Kings I</p>
	<p><b>5:30pm</b> Systems Engineering Competencies for Enterprise Transformation</p> <p>Rabia Khan, Clifford Whitcomb and Ronald Giachetti (Naval Postgraduate School, USA)</p> <p>Paper #1570341069 Room Kings I</p>
	<p><b>5:45pm</b> Defining an Enterprise Lead Systems Integration (LSI) Framework</p> <p>Warren K. Vaneman (Naval Postgraduate School, USA); Ron Carlson (Stevens Institute of Technology, USA)</p> <p>Paper #1570340859 Room Kings I</p>

KINGS II ROOM MONDAY JUNE 19TH SESSION MAII CHAIR: TBD	
Special Session - Systems Governance and Policy	<p><b>10:45am</b> Emergence as Innovation in Systems of Systems - a Three Systems Model</p> <p>Thomas A McDermott, Jr (Georgia Tech Research Institute &amp; Georgia Tech Sam Nunn School of International Affairs, USA); Molly Nadolski (Georgia Institute of Technology, USA)</p> <p>Paper #1570345612 Room Kings II</p>
	<p><b>11:00am</b> Incentivising the Dissemination of Truth Versus Fake News in Social Networks</p> <p>Abbas Ehsanfar and Mo Mansouri (Stevens Institute of Technology, USA)</p> <p>Paper #1570347637 Room Kings II</p>
	<p><b>11:15am</b> Sustainability policy-making as a dynamic, agent-based system of systems</p> <p>Steven Hoffenson (Stevens Institute of Technology, USA)</p> <p>Paper #1570348363 Room Kings II</p>
KINGS II ROOM MONDAY JUNE 19TH SESSION MP1I CHAIR: TBD	
SoSE Simulation, Modeling and Analysis Methods (1 of 2)	<p><b>3:45pm</b> Deriving Stochastic Properties from Behavior Models Defined by Monterey Phoenix</p> <p>John Quartuccio, Kristin Giammarco and Mikhail Auguston (Naval Postgraduate School, USA)</p> <p>Paper #1570345214 Room Kings II</p>
	<p><b>4:00pm</b> Identifying Decision Patterns Using Monterey Phoenix</p> <p>John Quartuccio, Kristin Giammarco and Mikhail Auguston (Naval Postgraduate School, USA)</p> <p>Paper #1570341093 Room Kings II</p>
	<p><b>4:15pm</b> Data Dependency Network Analysis in SoS</p> <p>Reggie Cole (Lockheed Martin Corporation, USA)</p> <p>Paper #1570338483 Room Kings II</p>
	<p><b>4:30pm</b> Modeling Human-Technology Interaction as a Sociotechnical System of Systems</p> <p>Jessica Turnley (Galisteo Consulting Group Inc, USA); Amanda Wachtel, Karina Munoz, Matthew Hoffman, John Gauthier, Ann Speed and Robert Kittinger (Sandia National Laboratories, USA)</p> <p>Paper #1570339824 Room Kings II</p>

**KINGS I ROOM MONDAY JUNE 19TH SESSION MLI CHAIR: TBD**

Robotic Systems, UAVs, ROVs, Drones, etc. (3 of 3)	4:45pm	<b>Design and Development of a Low-Cost Autonomous Surface Vehicle</b> Benjamin Champion (Deakin University, Australia); Van Thanh Huynh (Colleague, Australia); Gokul Thirunavukkarasu, Lachlan Patrick, Lloyd Hock Chye Chua and Matthew Joordens (Deakin University, Australia)	Paper #1570345550 Room Kings I
	5:00pm	<b>Eye Sensor for Swarm Robotic Fish</b> Nnamdi Elege, Suhasini Solapurkar and Matthew Joordens (Deakin University, Australia)	Paper #1570344806 Room Kings I
	5:15pm	<b>Implementation of Automated Vanilla Pollination Robotic Crane Prototype</b> Tuan Giang, John Kuroda and Ted Shaneyfelt (University of Hawaii at Hilo, USA)	Paper #1570331183 Room Kings I
	5:30pm	<b>A Context-enabled Systems Development Method</b> Anders Nykaas and Yang Yang Zhao (University College of Southeast Norway, Norway)	Paper #1570337701 Room Kings I
	5:45pm	<b>A Research Framework on Mission Planning of UAV Swarm</b> Xin Zhou, Weiping Wang, Xiaobo Li, Tao Wang and Zhifei Li (National University of Defense Technology, P.R. China)	Paper #1570352258 Room Kings I

**KINGS I ROOM TUESDAY JUNE 20TH SESSION TAI CHAIR: TBD**

Internet of Things / Control	10:45am	<b>An IoT Self Organizing Network for 5G Dense Network Interference Alignment</b> Anil Kumar Yerrapragada and Brian T Kelley (University of Texas at San Antonio, USA)	Paper #1570345200 Room Kings I
	11:00am	<b>Software Architecture of Self-Organizing Systems-of-Systems for the Internet-of-Things with SosADL</b> Flavio Oquendo (IRISA (UMR CNRS) - University of South Brittany, France)	Paper #1570344966 Room Kings I
	11:15am	<b>Using a Systems of Systems modeling approach for developing Industrial Internet of Things applications</b> Aurelijus Morkevicius (Kaunas University of Technology & No Magic Europe, Lithuania); Lina Bisikirskiene (Kaunas University of Technology, Lithuania); Graham Bleakley (IBM UK Ltd, United Kingdom)	Paper #1570340827 Room Kings I

**KINGS II ROOM MONDAY JUNE 19TH SESSION MLII CHAIR: TBD**

SoSE Simulation, Modeling and Analysis Methods (2 of 2)	4:45pm	<b>System of Systems Architecture Feasibility Analysis to Support Tradespace Exploration</b> Ronald Giachetti, Eugene Paulo, Paul Beery and Alejandro Hernandez (Naval Postgraduate School, USA); Stephen Gillespie (United States Military Academy & United States Army, USA)	Paper #1570340877 Room Kings II
	5:00pm	<b>Building Executable Discrete Event Models with SysML and Alf</b> Matthew Amisshah, Ange-Lionel Toba, Sarah Bouazzaoui and Nima Shahriari (Old Dominion University, USA)	Paper #1570347250 Room Kings II
	5:15pm	<b>Techno-economic Analysis of SysML Models</b> Mara Nikolaidou and Christos Michalakelis (Harokopio University of Athens, Greece)	Paper #1570345471 Room Kings II
	5:30pm	<b>A simulative analysis of translational vibrations across trainsets using Modelica</b> David Meinel, Songya Jia, Toni Donhauser and Jörg Franke (FAU Erlangen-Nuremberg, Germany)	Paper #1570339687 Room Kings II

**KINGS II ROOM TUESDAY JUNE 20TH SESSION TAIL CHAIR: TBD**

Defense, Space, National Security	10:45am	<b>Multi-dimensional Information Filter for Space-Based Platforms (MIFS)</b> Paul C. Hershey (Raytheon, Inc., USA)	Paper #1570349685 Room Kings II
	11:00am	<b>Using Social Network Analysis to Quantify Interoperability in a Large System of Systems</b> James Enos (Stevens Institute of Technology); Roshanak Nilchiani (Stevens Institute, USA)	Paper #1570339163 Room Kings II
	11:15am	<b>Trends in Large Scale Systems-of-Systems for Multi-National Missile Defense</b> Tod Schuck (Lockheed Martin & Rowan University, USA); James Kilian (Lockheed Martin, USA)	Paper #1570340879 Room Kings II
	11:30am	<b>Complex System Governance: Advancing Prospects for System of Systems Engineering Applications</b> Charles Keating, Adrian Gheorghe and Polinpapilinho F. Katina (Old Dominion University, USA); Raed Jaradat (Mississippi State University, USA)	Paper #1570340975 Room Kings II